

VOL. 43, No. 11

5 LARA

NOVEMBER, 1975

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amateur radio

NOVEMBER 1975 VOI 42 No 11 Drice: 90 cente (ffice mail delivered

ICHIBNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA, FOUNDED 1910

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VKSACA

AKSASC

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VK3OM

VK3GK

VK3VEI

VKSALII

VK5CA

VK5I P

1 30187

VK3TX VK3ZDH

WAATT

OSP _ TRADING

A long letter from a keen member in Townsville was referred by the Editor (to whom it was addressed) on his return from holidays to the Evecutive In brief the letter suggested that the Institute should engage centrally in trading. To Published monthly as the official journal by

provide working capital contributions should be sought from members or debentures the Wireless Institute of Australia issued. At an everage of \$20 per member the total should reach about \$90,000. The trading Reg. Office to be on a fully commercial basis dealing initially in amateur equipment with possible

P.O. Box 150 Toorak Rd., Toorak, Vic. 3142 expansion at a later date into other electronic and similar fields This is not the first time such an idea has come un for consideration. Many Divisions have been active for a long time in limited trading activities confined to members. Surplus Editor Bill Roner

gear has been handled over the years but this has dwindled. Attention has therefore been VKSADZ directed more and more towards components and kits designed for home construction use. A natural extension would have been a central WIA agency to handle these things but VALOU IN

many factors prevented this from happening. Several Divisions have done very well out of their own "disposals" activities. Only in the last four years has there been a formal central organisation by Constitution

Everything of common concern to the Institute was, and still is controlled by the Federal Council comprising one representative from each fully autonomous Division man-

ening State offeire y state allairs.

Refore the present are of inflation coming so soon after establishing the central organisation, there was little need for large sums of money to offset costs of a non-

Divisional nature. The climate was right for normal trading companies to sell amateur requirements according to the needs of the times. There are now many outlets for amateur require-

ments to cater for the appliance user as well as the home constructor. In fact there are some grounds for believing that competition today has depressed the net profit margins quite considerably. A new entrant into this field must more than ever before acquire and stock the right goods at the right price for re-sale on the one hand at a competitive price and yet on the other to make reasonable profits to keep going. If central trading were to be approved by Federal Council it would have to be done

for Constitutional reasons as a separate commercial enterprise under close control and proper management. These and other requirements need not be beyond attainment. However, the outlook for launching such a project differs according to the view-

point be it Melbourne or Perth or Cairns or elsewhere. As is to be expected in this specialised field the largest cities seem to be well catered for although mail order business exists but increases prices and creates other problems. It could be thought that amateur near could be bought much cheaper if we had

VK3ZIK our own trading company but accountants demand satisfactory profits not solely to ensure adequate returns on capital. A most detailed analysis would be absolutely essential. The Institute would have to VK3CIE

look for an assured net profit of at least \$15,000 or \$20,000 after tax, staff wages, and general overheads have been paid. A few thousand dollars once every few years would not be worth the effort. To achieve such a return the annual turnover might well have to be \$200,000 or more if the store has to be competitive.

The Executive would not be daunted if Federal Council decides that trading must be begun. There are ample resources available to draw on expert advice at all stages particularly to determine the viability of such a project in the beginning. It is recognised that some regular source of income is needed to keep subscription rates from getting out

of hand. Many other Amateur Radio societies face this same problem. However, an answer must be found to another equally important question. What other areas should be explored to achieve a reasonably viable source of subscription subsidisation? Such as doubling our membership, expanding "Magpubs" activities. setting

un a credit union, and so on, The Executive.

Advertising material should be sent direct

Assistant Editor:

Tankalani Editore.

Publications Committee:

Rodney Champness Syd Clark Ron Fisher

Contributing Editors:

Bruce Bathole

Pill Dies

Ron Cook

Roly Roper

John Adenck

Ken Gillespie

Nell Ochorne

Ken Revnolds

Brian Austin

Gordon Row

Harry Cane

David Hull Eric Jamieson Jim Payne

Deane Blackman

Drafting Assistants

Rusiness Menener

Enquiries and material to:

out specifying any reason.

The Editor, PO Box 2611W, GPO Melb., 3001

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month. Acknowledgment may not be made unless specially requested. All important items should be sent by certified mail.

The Editor reserves the right to edit all

material, including Letters to the Editor and Hamads, and reserves the right to

refuse acceptance of any material, with-

Peter B Dodd

Cil Conce

to P.O. Box 150, Toorak, Vic., 3142, by the 25th of the second month preceding publication. Phone: 24-8652.

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> EQUITY PRESS PTY, LTD. 50-52 Islington Street Collingwood, 3066 Tel.: 41-5054, 41-5055

Remember how the Institute's Executive went to work in the past few years to gain duty free admission for transcrivers? And were successful.

CUSTOMS DUTIES

The draft report on telecommunications equipment by the Industries Assistance Commission has now come to hand.

Section 2 of the report deals with interests covering aerials and radio telegraphic and radio telephone apparatus including mobile transceivers, communications receivers, HF transceivers and the like. Two sub-paragraphs of section 2, 8 in the Report acknowledged requests for duty free entry being made in relation to amateur radio equipment by the Wireless Institute among others. The next sub-para reads:-

"Some of the abovementioned products already enter under by-law. The Commission considers that the remaining requests for duty free entry of specific items would be more appropriately dealt with through the hydraw system

Page 13 of Appendix 4 to the Report adequately summarises the original Institute's submissions under Tariff Item 85.15.9 as follows:-

(a) The admission of all transceivers of a kind designed for and solely capable of use on amateur frequencies as a permanent measure — no certification, no security, no statutory declaration; applicable to new and used transceivers, for HF, UHF/SHF, commercially built or home constructed, through all ports, commercial or private imports for re-sale or own use, as freight or in baggage and

WIANEWS

At the time of writing the burning question is still the industrial dispute which has caused disruption in the examinations area. A copy of letter 320/5/101 of 22nd September received from the Postmaster-General is published elsewhere in this issue. This was in response to a telegraphic protest sent to the Minister by the Executive when it became known that the August exams also came under the ban.

It is too early to expect that the last award handed down by the Arbitration Commission will or will not cause the door to be opened for the successful conclusion of the dispute.

Information available to the Executive indicates that meetings between the PMG's Department and all interested parties have been held on several occasions but so far without success. The Executive is very well aware that 'outsiders' could create

additional problems if they are seen to seek direct intervention but the situation is under constant review in the light of developments. This sounds all very wordy but the old adage about 'fools rushing in where angels fear to tread' was not coined for nothing.

September seems to have been a month of information flowing in for consideration of action to be taken after receiving comments from Divisions.

One such item was a letter from the Secretary of the Radio Frequency Management Division of the PMG's Department advising that the call sign block RAA to RZZ has definitely been allocated for use by any amateur repeater or beacon.

The previous allocation of the blocks RSA to RTZ solely for amateur beacons has now been rescinded - see AR Dec., 1972,

This whole question came to the fore last year when one Division required that repeater call signs should be made available so as to identify the geographical location or service areas of each repeater. As a result of this the Executive supported the request. The previous restriction of call signs for repeaters deriving from the block RAA to RAZ has thus gone overboard and presumably repeater owners can now request their own geographical call sign even if it falls within the RSA to RTZ block. Presumably the same will apply to beacons.

It is believed that the PMG's Department will have reserved the right to allocate any call-sign in the RAA to RZZ block for any other amateur use in line with the general conservation of call letters.

Another letter from the same source dealt with repeater conditions in reply to a preliminary letter from the Executive on this subject back in May. A couple of quotes from this letter might be useful. Quote number 1 — "The Department has always been happy to consider representations from your Institute and I have no doubt that this cordial situation will continue in the future". Quote number 2 - "The Department does not propose to impose unnecessary rules on the Amateur Service but, provided they are framed within the current licensing conditions, no objection in principle is seen to additional rules being devised and applied by amateurs for operation of their services"

Yet another letter from "Central Office" clarifies the procedures to be followed by "C" calls operating in different states. It is now clear that if the owner of a "C" call registered in one State visits another State for a period not exceeding 5 days all he has to do is to change the numeral in his call sign and of course abide by paragraph 120 in the Handbook. Thus if VK3CDZ goes to Canberra for a couple of days at a time he uses the call sign VK1CD7 and not VK3CD7/VK1 as would be customary for normal series call signs. Letter RB4/8/1 of 8-9-1975 refers.

A letter from the Minister for Defence confirms that the NDO and Directors of State/Territory Emergency Services have been advised of the name and function of the Federal WICEN Coordinator (Brig. Rex Roseblade VK1QJ) and asked to ensure cooperation with WICEN.

Peter Brown, VK4PJ, donated a cup designated the "Contest Champion Trophy" and the rules for this annual award have been received but await adoption. Peter suggested the first "period should be 1st October, 1975 to 1st October, 1976 and the Federal Contest Manager should take into account the highest aggregate scores obtained in the 1975 VK/ZL contest, the 1975 Ross Hull, the 1976 John Movie Memorial NED and the 1976 R.D. Contest.

It is unfortunate that the draft rules arrived too late to be included in October AR and equally unfortunate that the office of F.C.M. is under change. In any event they must be considered and adopted as early as may be possible. The handsome trophy donated by Peter is held by the Executive and awaits its first annual owner hopefully before the end of 1976.

The Federal President is scheduled to meet Mr. F. Green, the Head of the PMG's Department, later in October at which a number of high level administrative arrangements are to be discussed. Obviously the IARU related Motions from the 1975 Federal Convention concerning W.A.R.C. 1979, legislation affecting the amateur service, examinations, licence fees and frequency management are likely to be items at the top of the list.

Also at this time of the year Divisional Councils will be seriously considering their subscription rates for 1976. The Executive have done their homework and concluded that the Federal element of the 1976 Full and Associate Members' subscriptions should indeed be recommended as the \$14.50 adopted at the 1975 Federal Convention. Out of this amount \$7.20 will be the direct cost of AR plus 30 cents for the IARU contribution.

Finally, it might be appropriate to mention that October was the 3rd birthday of OSCAR 6. Congratulations to everybody concerned with this amateur satellite and all amateur satellites.

effects: end-user criterion inapplicable. Transmitters and transverters of a kind designed for and solely capable of use on amateur (c) R.F. Linear amplifiers for amateur bands only. (Note - these appear to be covered by By-law

(d) Communications receivers designed for use and capable of use only on amateur frequencies. (e) Amateur band, Ancillary equipment for use such transceivers, transmitters and receivers - e.g. outboard VFOs, tuning units, etc. Would negotiate on separate power supply units which are of a kind manufactured domestically and similar

already).

items. (f) Items normally supplied with each piece of pparatus (e.g. microphone ordinarily sold as part

of transcelver) 1. WIA (Wireless Institute) accepts the need to foster and encourage local industry but the amateur market is so selective and of such small proportions that the importation of amateur equipment not de-

signed for use on other frequencies and not readily and cheaply convertible should enjoy duty free con-2. Certain items for use by amateurs already

appear to enter under by-law — e.g. Aerial rotators, monoband and multi-band antennas, HF Vertical antennas, LP Filters, antenna couplers. Some articles classified under other Tariff headings. Readily understood, easily administered and positive identification at time of import are criteria

greatly to be recommended in this somewhat techni-

4. WIA happy to assist in any way and to provide definitions where desired. Would agree to impor-tation of "difficult" items under statutory declarations for amateur end-usage. After receiving and considering any further submissions it is assumed the draft report will become,

after any amendments and additions, the final Report which will be submitted to Government in due course. Whether or not the Government will accept the recommendations of the final Report will of

course remain to be seen.

BURMA

"The authorities in Burma have prohibited everything that has the slightest thing to do with Amateur Radio. Even the import of radio parts is on the black list. So if you write to an Amateur in Burma do not use his call sign. In some cases it is known that the Amateur landed in Jail because of sup-posed activity". The World Radio News, June, 1975.

WICEN NETS-VKS

VK6AN writes that visitors to VK6 may be interested to note that the best frequencies for contacts with WICEN operators in VK6 are 3.6 MHz daily at 00.00 Z. 7.1 MHz daily at 04.30h Z and Ch 1 is monitored at all times. At 02.00h Z Sundays there is a WICEN callback after the VK6 broadcast; frequencies are 3.6 or 7.1 depending on band conditions. The other daily monitoring frequencies are given as 14.106 at 03.00h Z, 7.076 at 08.30h Z, 146.00 MHz FM nightly as well as 52,656 MHz in most areas most of the time Ch 4 is monitored in the Narrogin-Wagin area and Ch 2 in the Albany-Mt. Barker area.

TRANSCRIPT OF ADDRESS BY THE PRIME MINISTER OF AUSTRALIA. THE HONOURABLE E. G. WHITLAM, Q.C., M.P.,

OPENING THE 1975 REMEMBRANCE DAY

CONTEST ON 16th AUGUST, 1975 "I am honoured by your Institute's kind invitation

to declare open your 1975 Remembrance Day Con-It is right that we should remember the amateur radio operators who laid down their lives for

Australia during two world wars. This occasion has taught me a little more about your useful and remarkable hobby. Perhaps the word 'hobby' is a misnomer for such a varied leisure activity. Your contacts as radio operators are truly world-wide. As amateurs you have been experimenting for many years with your own satellite and communicating with other amateurs as far afield as Africa and Japan. With the next generation of amateur satellites you will be able

to contact your friends much further afield in the U.S.A. and elsewhere. In these days of developing communications Australians can pick up their telephone for discussions with people round the globe at any time, but the process is expensive. It is surprising indeed that you in your shack can talk at almost no cost with old friends and make new ones anywhere in the world. You are truly private ambassadors for Australia and I have no doubt that the network of amateur radio communication makes a valuable contribution to international

understanding. I commend your work in providing communications with stricken areas and your ability to move into action quickly in a national emergency. My colleague, Senator Bishop, the Postmaster-General,

assures me that every possible facility is given to amateurs involved in emergency traffic. I believe the use of amateur satellites for communications in emergencies will be more fully exploited At present you have training classes for your members, particularly in Youth Radio Clubs, and I

hope you will try to widen your educational programmes and bring knowledge and experience of your existing work to the widest possible audience. Young people today with their natural interest in scientific knowledge and advancement would want to know more of your work and how they may par-

I have much pleasure in declaring open the Wireless Institute of Australia 1975 Remembrance Day Contest".

THE NORTH QUEENSLAND CONVENTION

London has its Changing of the Guard. Melbourne has its Moomba. And Townsville -

it has its Radio Convention which is better still.

You who weren't there missed out on a great time while the lucky ones who did attend had a ball. Occurring during the bleak southern winter month of July, it provided a very enjoyable escape for those that came, for the daytime weether was line and sunny and the nights mild. The only

unfortunate thing is that it occurs only each second year — but perhaps that's a good thing as it allows new ideas to be thought up and plenty

of planning to be made by visitors.

The programme of events took second place to the renewal of old friendships and the kindling of new ones This is the true meaning of Convention - whe

souls of a like nature convene. As a result Amsteur Radio has received a valuable 'Shot in the Arm' by the efforts of the Townsville Amsteur Radio Club in North Queensland VK47F7

Townsville Amateur Radio Club Publicity Officer

AOCP EXAMINATIONS

The following letter was received in response to a telegram sent by the WIA.

320/5/101 Postmaster General

Canberra, ACT 2600 22 September 1975 Dear Mr Dodd

I refer to your recent telegram concerning the postponement of the August examination for the Amateur Operator's Certificate of Proficiency.

The industrial dispute which has so far prevented this examination from being held, concerns staff classifications. The parties involved in the dispute are the Australian Public Service Board, the Staff Association representing the officers of my Depart-

ment who conduct examinations and, to a les extent, my Department. Attempts to reach a solution to the dispute are being pursued as expeditiously as possible. Noting, however, that certain instructions have been given to staff by their Association, it would be pointless

to attempt to re-schedule the examination until the difficulty is resolved. The dispute has already been widened to include other examinations conducted by my officers and I am loath to initiate any action which could pre-

cipitate further disruption of my Department's I regret that some inconvenience was caused to candidates but I am sure you will appreciate that

the postponement is outside the control of my You may be assured that following settlement of the dispute, the earliest practicable date will be selected for the examination and all candidates

advised accordingly. Yours sincernly.

R Rishon Mr. P. B. Dodd, Secretary, The Wireless Institute of Australia, P.O. Box 150, Toorak, Vic., 3142

HISTORY OF SOUND AND MOVIES

In a recent letter from Jim Davis, registered SWL and future novice licenses of 55 James St. Latrobe Tasmania, comes news of a rather unusual sideline. Jim has obtained and fully restored equipment FLMEASCO INSTRUMENTS PTY, LTD.

ADVISE THAT A DISPLAY OF DRAKE AMATEUR EQUIPMENT

WILL BE HELD AT THEIR MELBOURNE OFFICE

21/23 Anthony Drive Mount Waverley Phone 233 4044

ON WEDNESDAY 19th NOVEMBER 1975

From 1 p.m. until 9 p.m. ALL ARE WELCOME

The attached photograph gives a brief idea of some of the equipment on display. This includes the 1916 Telefunken Spark tra

mitter/receiver used by the Navy during World War 1 at Currie, King Island, TRF Battery Receivers, War 1 at Currie, King Island, IHP Battery Receivers 'all electric' sets of 1928 vintage, one of the firs Erams Record players with automatic changer, ar 1893 Edison Projecting Kinetoscope and many other items from the early days to the present time.

The museum is on display in Jim's private Cinemascope theatrette in his new home at the



AMATEUR BUILDING BLOCKS

PART FIVE

DIGITAL MODULES

This final part of the Building Block series covers the predominantly digital functions. Three such modules are presented — a crystal clock pulse generator, a gating and control unit and a display or indicator unit.

Section 2 - Unit H --CRYSTAL CLOCK

This unit is a comprehensive crystal clock and divider chain which produces accurately controlled timing pulses between 10 MHz and 0.025 Hz. The module can be used for a variety of purposes including control of a counter or timer, production frequency markers and to act as a standard in the digital stabilisation of a VFO.

The circuit diagram is given in Fig. 21 while the component layout is given in Fig. 22.

A 10 MHz crystal oscillator is formed using two gates of a 74 HOO or 74 SOO quadruple NAND array, the remaining two sections being used to buffer the output. The oscillator is followed by eight 7498 in the divide by ten mode and outputs taken after each stage so that a total of nine decade outputs are available ranging from 10 MHz down to 0.1 Hz.

Also on board, but divorced from the main divide chain, is a 74107 dual JK flip flop. This chip enables any one of the main decade outputs to be further divided by two and/or four so that, if required, outputs down to 0.025 Hz, or one pulse every 40 seconds, are available.

Note that each output from the dividers is capable of driving another eight 7400 series inputs so that, for example, the 100 pps output could be used to drive external logic and at the same time could be routed through the 74107 to provide 50 Hz and 25 Hz as well. The only forbidden interconnection is to join two outputs together.

While a trimmer is provided on the board to adjust the crystal to its correct operating frequency it is often worthwhile to be able to do this adjustment from a remote point - say a front panel control. Provision is therefore made on the board for a BA102 varactor diode and its associated decoupling components. The only off board control is the potentiometer and associated 3.3K fixed resistor. It should be stressed that the supply to the potentiometer, and thus to the varactor diode, should be very well regulated or else the facility will degrade the stability of the oscillator. The value of the control voltage is less important than its stability, any value between 10 and 15 volts being satisfactory. If this external control facility is not required the components are simply omitted. The accuracy of the clock is a direct function of the crystal used. If the accuracy

100,000) then a low priced crystal can be used. Short term accuracies of the order of 1 part per million can be obtained using a Hy Q Delta GF crystal which is more expensive but which has been designed to have minimum change of frequency with temperature in the 15-25 deg. C region. For greater accuracy, a crystal oven and a crystal designed for the oven temperature are necessary.

(if it is required), the whole module is powered from a 5 volt regulated line. Use of a LM 505K (hallonal) or 725C (Fairchild) of a LM 505K (hallonal) or 725C (Fairchild) or most supply houses. Note that if these regulators are used then an input capacitor of 0.1 or 0.22 mFd and a 4.7 or 10 mFd tantalum capacitor should be fitted right at the regulator using the shortest possible at the regulator using the shortest possible

H. L. Hepburn VK3AFQ

4 Flizabeth St., Fast Brighton, 3187

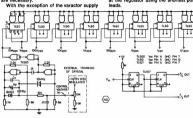
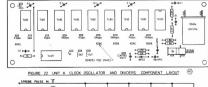


FIGURE 21 - UNIT H - CLOCK OSCILLATOR AND DIVIDERS



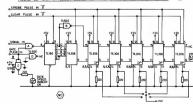


FIGURE 23-UNIT I - 40MHz 6 DIGIT DISPLAY - CIRCUIT DIAGRAM

requirements are modest (say 1 part in Page 6 Amateur Radio November, 1975

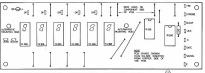


FIGURE 24 - UNIT 1 - 40MHz 6 DIGIT DISPLAY - COMPONENT LAYOUT If the full range of output down to 0.025

Hz is not needed then the decade dividers (7490s) after the lowest required frequency are omitted. For example, if only a 100 kHz signal is wanted then only dividers 1 and 2 are used and dividers 3 to 8 omitted. Section 2 - Unit I -

GATING AND DISPLAY UNIT

The proliferation of opto-electronic devices over the past two or three years has been rapid. Whereas in late 1972, when the writer was designing a counter (later described in AR), the only easily obtainable display was the incandescent filament 3015F. At the present time this type of display has been superseded by a wide variety of LED based readouts which vary in size. format and drive requirements, Most decade display units published in amateur literature have been made up of four separate ICs (divider, latch, decoder/driver and readout) each requiring a relatively large PCB to mount them and some sort of base in which to plug each decade board. More recently devices containing all the functions combined into one 16 pin DIL case have become available, notably the Texas Instrument TIL306/308 series. Use of these 'combined' displays has much to recommend it since the total area of PCB required is considerably reduced, the labour of wiring up has been significantly lowered and the volume of a complete display has been cut to under a quarter. Total cost (as distinct from chip cost!) has also been reduced. Thus the writer has designed the display unit now presented around the TI devices. They are stocked by the Radio Parts Group, 562 Spencer Street, West Melbourne, Vic. 3003.

The TIL306, which is a seven segment, two bars per segment, LED decade divider, latch, decoder and readout with a LH decimal point option, has one minor limitation in that the maximum operating frequency of the decade divider is 18 MHz. However this is only a problem in the right hand (or least significant figure) display and when it is desired to read a frequency to the nearest Hz.

In order to overcome this frequency limitation a TIL308 is used in the first stage. This is a TIL306 without an inbuilt decade divider, the division being done outside the chip using a high frequency divider such as the 74196 to give the display a 50 MHz capability. This is the approach adopted as reference to the circuit diagram (Fig. 23) will show. The signal gate is on the display board and uses a 7400 (for inputs up to 20 MHz) or a 74 SOO (for frequencies up to 40 MHz). Only five inputs are required:

1.5 volts 1 amp well regulated HT. 2. Signal - amplified and squared so as to be TTL compatible.

3. A negative going strobe pulse. 4. A negative going clear pulse.

5. A positive going timing pulse. All the required inputs, except the 5 volt

regulated supply, are produced by Unit J which is the next (and last) unit described in this series of articles. Only two of the four gates of the 7400/

74 SOO are essential to the display proper so use is made of one of the spare gates (Gate C) as a buffer/driver for a gate speed LED which can be mounted remote from the display on some other part of whatever cabinet is used. This gate speed indicator is purely optional.

The incoming (TTL compatible) signal (from Unit J for example) goes to one input of Gate A, with the timing pulse from the control unit being applied to the other input of Gate A. When the timing pulse is high, Gate A passes the input pulse to the display. When low the signal pulses are not passed.

The pulse train passed by Gate A to the display enters a 74196 50 MHz decade divider. The binary outputs are taken to the TIL308 for decoding and display. The D output is inverted by Gate B and applied to the input of the first of five TIL308 decades.

The facility is provided to blank out all zeros showing on the left hand side of the display. Preferences for this type of zero blanking seem divided so that an external switch is suggested to allow the facility to be used if desired. One point in favour of zero blanking is the reduction in the overall current demand of the display.

No specific decimal point switching is given since the exact format will depend on the use to which the display is put. The circuit diagram (Fig. 23) shows that it is necessary to take the DP pin 13 low to extinguish it. This can be accomplished by permanently wiring a 220 ohm 1/8th watt resistor between the DP pin of each of the five TIL306s and earth. Applying 5 volts regulated (either directly or via a multiposition rotary switch) will cause the DP to light up. Note that if the DP pin connection is left 'floating' (i.e., not connected directly to earth or to earth via a low value resistor) then it will remain alight.

It is strongly recommended that 16 pin IC sockets be used to mount the TIL308 and the TIL306s and that the devices themselves not be soldered directly into the board. Sockets leaving a space between the back of the TIL306/308 and the centre of the socket are recommended to allow a free flow of cooling air over the displays. Components are mounted in the usual fashion on the non-copper side of the

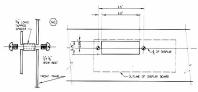
board, but the PCB stakes shown in Fig. 24 are inserted from the copper side of the board, since it is this side which is accessible when the board is in place on the panel. Board mounting details are given in Fig.

A separate PCB stake is provided for

each TIL306 decimal point, The DP outlets and their associated 220 ohm resistors are wired as dictated by the DP switching used.

The physical and electrical format used for this display board makes it extremely flexible. The display will continue to operate even if the TIL308 is not in place. although of course it will have ten times less readout resolution, Similarly successive left hand TIL306s can be removed without causing the display to stop operating, The practical minimum number of displays is probably three. Since the clock module (Unit H), the display module (Unit I) and the processor module (Unit J) have so many options, the ways in which they can be combined together are also many.

The writer is prepared on receipt of a stamped addressed envelope) to give interconnection and switching information where the enquirer has a specific end use in mind.



25 - DETAIL USING ALTERNATIVE MOUNTING HOLES

Deluxe Mobile/Base Station

FT-101E/EE - from Yaesu Musen Co. of Japan



F MODEL with RF PROCESSOR \$698

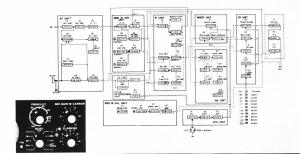


FF MODEL without RF PROCESSOR \$651

RF SPEECH PROCESSOR - \$70 plus P & P

Solid State 160 thru 10 Meter Transceiver

The world's number one transceiver now offers even more value and performance in one, compact, thirty pound package. An effective, RF Speech Processor is a built-in integral part of this exciting transceiver. Now you can realize that extra talk power to cut through the pile ups without the addition of a linear amplifier, Except for the final and driver stages, the FT-101E/EE features the latest in solid state technology, incorporating time proven, plug-in "computer type" modules for unparalleled reliability and servicability. New lever type switches offer easier operation. Here is a complete radio station designed to go anywhereideal for todays active amateur, Just add an antenna and 12 VDC or 100-234 VAC for instant operation on 160 thru 10 meters. The FT 101E/EE is another step forward in amateur communications from the world's leader in communications equipment, YAESU- The Radio Company.





ELECTRONIC 60 Shannon St., Box Hill North. Vic., 3129 SERVICES MITCHELL RADIO CO., 59 Albion Road, Albion, 4010 STEPHEN KUHL, P.O. Box 56, Mascot, 2020





FFATURES

- Built-in AC & DC power supplies Built in RF-speech Processor for increased talk power (E model only)
- 260 Watts PEP SSB, 180 Watts CW, & 80 Watts AM, Factory sealed, solid state VFO for optimum stability and accurate 1 KHz readout
- Effective Noise Blanker, threshold adjustable, for elimination of noise spikes
- Built-in, fully adjustable VOX
- Automatic break-in CW operation with sidetone Selectable 25 KHz and 100 KHz calibrator
- ±5 KHz receiver clarifier w/separate ON/OFF switch Built-in WWV/JJY reception Heater switch to shut off final tubes for conservation of
- Reliable easy to operate lever panel switches

- Adjustable carrier level for tune-up and novice operation Built-in speaker High-Q, permeability tuned, RF stages to provide the
- performance required even in base station operation
 - Includes dynamic, hand-held type microphone
 Indicator lights for internal VFO and clarifler operation
 Eight pole SSB filter for unparalleled selectivity on today's crowded bands
- All mode operation SSB, CW & AM Built-in internal crystal control provision and Dual VFO
- adaptor Complete line of compatible accessories for flexible station
- design (CW filter, ext. VFO, ext. speaker, mobile mount, 6 m transverter, monitorscope, digital readout adaptor)
- English language factory instruction manual with full circuitry. AC and DC power cables, all connectors.

TECHNICAL DATA GENERAL

Frequency Range: 1.8-2.0 MHz, 3.5-4.0 MHz. 7.5 MHz, 14.0-14.5 MHz, 21.0-21.5 MHz, 27.0-27.5 MHz, 28.0-30.0 MHz all full transmit and receive. MMz, 28.0-30.0 MHz all full transmit and receive. WWV 10.0-10.5 MHz (receive only). One auxiliary 500 kHz segment is available except for IF and VFO frequency range. Heterodyne crystal for 1.8-20 MHz is available optionally. (NOTE: All out sets include this crystal)

Mode: Selectable USB, LSB, CW or AM. Frequency Stability: Within 100 Hz during any 30 minute period after warm-up. Not more than 100 Calibration Accuracy: 2 kHz maximum after 100 kHz calibration.

Backlash: Not more than 50 Hz Antenna Impedance: 50 to 75 ohm unbalanced

Circuitry: 40 Transistors, 3 Integrated Circuits, 38 Diodes and 3 Tubes.

Power Requirement: 100/110/117/200/220/234 V AC. 50/60 Hz. 350 Watts maximum, or 13.5 V DC nominal, 5 A for standby, 0.5 A for receive (Heater OFF) and 20 A for transmit. Size: 340(W) x 153(H) x 285(D) m/m. Weight: 15.9 kg. (Shpg. wt.: 20 kg.).

RECEIVER

Sensitivity: 0.3 uV for 10 dB Noise plus Signal to Noise Ratio on 14 MHz. Selectivity: 2.4 kHz nominal band-width at 6 dB down, 4.0 kHz at 60 dB down on SSB, CW and AM. 600 Hz nominal bandwidth at 6 dB down, 1.2 kHz at 60 dB down with optional CW filter.

Harmonic & Other Spurious Response: Image Rejection better than 50 dB. Internal Spurious Signal

below 1 uV equivalent to antenna input.

Automatic Gain Control: AGC threshold nominal 3uV. Attack time 8 milli-Second and release time 1800 milli-second

Audio Noise Level: Not less than 40 dB below 1 Audio Output: 3 Watts to internal or external speaker at 4 ohm impedance. Audio Distortion: Less than 10% at 3 watts out-

TRANSMITTER

60 Shannon St., Box Hill North.

FARMERS RADIO PTY. LTD., 257 Angas Street, Adelaide, 5000

H. R. PRIDE, 26 Lockhart Street, Como, 6152

Input Power: 260 Watts PEP on SSB, 180 Watts on CW at 50% duty cycle and 80 Watts on AM except for 160 metre. Slightly lower on 10 metre). Microphone: 50 K ohm dynamic type. Carrier Suppression: -50 dB.

Sideband Suppression: -50 dB. Spurious Radiation: -40 dR. Distortion Products: -30 dB.

Frequency Response: 350 to 2700 Hz +3 dB. Final Tube: 6JS6C x 2.

> Vic., 3129. Ph. 89-2213

Ph 57 6830 Ph Day 667 1650 A.H. 371 5445

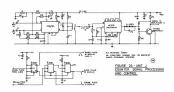
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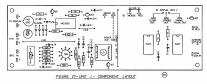
All prices include S.T., Freight extra, Prices and specifications subject to change, 90 DAY WARRANTY

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Section 2 — Unit J —

SIGNAL PROCESSING AND CONTROL
This module has three functional roles. In

the first place it acts as a signal shaper accepting a low level (better than 30 mV RMS) signal and after amplification and squaring, outputs a TTL compatible waveform to drive the six digit display of Unit I.

Secondly it generates the necessary gating strobing and clearing commands so
that the display unit may be used as a
counter and finally, the module provides a
mixing facility so that, say, the BFO and
VFO of a single conversion Rx/Tx can be
combined to re-constitute the signal frequency and allow it to be displayed in the
form of a 'digital diai'.

Fig. 26 gives the circuit diagram of the three functions involved, Fig. 27 gives the component layout on the 6 in x 2 in circuit board, while Fig. 28 shows how Units H, I and J can be interconnected to make a 30/40 MHz digital frequency meter or a

digital dial display. The signal processor uses a Motorola MC 1035P triple line receiver. The circuit is the same as that used in the DFM described by the writer in AR (1973). In spite of much experimentation with other, and simpler, signal processors the original circuit is still considered to be the most flexible. especially at higher frequencies, and has thus been retained. The input impedance is approximately 1000 ohms and sensitivity is better than 30 mV RMS from 100 Hz to 40 MHz. Occasionally some low frequency instability is encountered and can be cured by additional decoupling of the bias supply (Pin 9) with about 2000 mFd. A response down to 10 Hz can be obtained by increasing the size of the two 0.1 mFd capacitors associated with Pins 10 and 11 to 1.0 mFd or larger.

The control circuitry is, again, essentially that used in the 1973 counter except that T4107 dual JK flip flops are used in place of 7495s, and the omission of the strobe buffer inventers. These buffer inventers were originally needed to provide the positive interest of the positive strong that the positive strong that the positive strong the positive strong that the strong the positive strong the positive strong the strong that the positive strong the strong that the positive strong the strong that the positive strong that the strong t

Two inputs to the control section are needed:

(a) A fixed 100K pps from the crystal clock of Unit H.

(b) A timing pulse from the crystal clock of Unit H. If the modules are to be used only as a digital dial then this timing pulse can be fixed at 10 pps or 1/10th second. If the modules are to be used also as a counter then switched selection of 1.0, 10, 100 and 1000 pulses per second from the clock is recommended, giving four sampling periods of 1.0, 0.1, 0.01 and 0,001 seconds.

The three outputs from the control section (gale, strobe and clear pulses) are connected direct to the corresponding inputs of the display module (Unit I). If types of display other than the TIL306/308 are used then it may be necessary to invert and/or buffer the clear and/or strobe pulses. Otherwise the TTL outputs from the control section are compatible with most other displays in current use.

The third on board function is a mixer, the purpose of which is to combine two inputs to give an output which is at signal frequency, and which can thus be processed and displayed (in conjunction with the crystal clock and the display unit) in the form of a digital dial.

The modules A through E (in previous lessues of AR) describe single conversion receivers and/or transmitters. The incoming signal is either added to or subtracted from the VFO frequency to produce a fixed if intelligible speech (for SSB) this IF frequency is exactly equal to the BFO input. Thus all that is necessary to reconstitute the signal is to add or subtract the VFO to AR an example consider a single of

As an example consider a signal of 14.1000 MHz and a VFO set at 5.1020 MHz. The resultant IF is 8.9980 MHz — the normal USB BFO crystal frequency.

To reconstitute the ACTUAL signal frequency it is necessary only to add the 8.9980 BFO frequency to the VFO on 5.1020 MHz to get 14.1 MHz.

The necessary mixing is done in a Motorola 1496/1596 or Fairchild 796 HC in exactly the same way as this device was used in earlier modules. The output tuned circuit is on the required signal frequency. The data for coil LS and resonating capacitor CS is the same as that given in Table 2.8 in the September 1975 issue.

Note that in a single conversion system the transmitter output is the algebraic sum

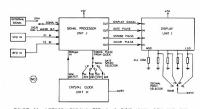


FIGURE 28 - INTERCONNECTIONS FOR A 6 DIGIT 40 MHz DEM AND DIAL

of the BEO and VEO frequencies and thus. for a transmitter only, the mixer is probably redundant. However, if the mixer is in use to reconstitute the frequency of a received signal then its use also to display the transmitted signal seems logical and avoids switching when changing between the receive and transmit modes. Where a 'clarifier' is in use then the frequencies of the transmitted signal and the received signal are not necessarily the same and use of an available facility to show the difference seems warranted.

Since only around 30 mV RMS is all that is required as input to the MC 1035 signal processor, the demands on the 1596/ 796 mixer are minimal and it can conventently be powered by the same 5 volt requlated supply that is used by the rest of the on-board logic

Links and PCB stakes are used so that the mixer, or the signal processor, or the control section can be used separately if so desired. Although provision is made on the board to balance out residual carrier (the two 22K fixed resistors and the 22K trimpot between Pins 1 and 4 of the 1596/796) this facility may not be strictly necessary when there is a large difference between the BFO/VFO and the mixer output frequency.

During the development of the three digital modules the writer had some doubts about nutting them into the same cabinet as the transceiver proper. However (and rather surprisingly) no desensitisation of the receiver was noted and the system has been used several times since with no problems

SOLAR FLUX, SUN SPOT CYCLE, AND THE DXer

Frank Hine VK2QL 30 Abbotstord Rd. Homehush, NSW 2140

For those amateurs who wish to keep the chart in March 1975 AR up to date, the following are the smoothed mean values issued since my was prepared -May 1974, 36.4: June, 36.2: July, 34: Aug, 33.1:

Sept. 32.1. I have gathered some additional Information which may be of assistance to those who have shown interest in my previous brief reference. WWVH gives the solar flux number and other pro-

pagation information in its broadcast on their 5 MHz transmission at 45 minutes past the hour and this possibly suits the VK boys better than WWV. I get a good signal from them round 0745Z. One interesting thing has emerged in the almost daily check I make, and that is the variation in the signal from WWV as against WWVH. One particular

day WWV was better than WWVH. It now transpires that the information broadcast by WWV & WWVH has been included at the

request of radio amateurs. To date there has been no further sunspots of the new cycle reported and the latest "guess"

is the bottom will not be reached until early 1977. Whilst my previous article mentioned my records 1954, this was used for the purpose of the exercise only, whereas in fact they go back 10 1750

For those who remember the magnificent band onditions we experienced in 1958, they and conditions we experienced in 1958, they and others may be interested to know the nearest previous high sun spot peak occurred in 1778 when The next highest number did not occur until 1946 when the peak was in the region of 156, followed by the best ever in 1958, that cycle being num-bered 19. I will be referring to cycle numbers again later. The last cycle, No. 20, reached 119 again later. Ine last cycle, No. 20, reached 19 (see March AR table), which was similar to 1917. The 1928 cycle, 16, only reached a peak of 80. After the peak of 1778, cycle 3 mentioned above, each cycle was less until the two lowest numbers. occurred in 1804, and 1816 when the peak of only approx. 45 was reached. The next cycle. No. 7 in 1830 only peaked at 65. The bottom between cycles 5 & 6 and 6 & 7 reached approx. zero. So . . ., if sunspot activity follows its previous pattern after a good cycle, amateurs are going to have to work hard for real DX, especially DXpeditions, and to help them know what to expect, keen a close watch on flux numbers etc. from WWVH and also the sunspot numbers. In Fig. 1 is reproduced a graph which was in an article written by W3ASK in March '75 CO.

By use of this graph in conjunction with the some idea of the propagation conditions he may expect. The graph has now caused me to keep in my daily records, the index as well as the flux number. The K index varies from 1 to 9, the higher the value, the greater influx of solar particles, which in turn causes weaker signals

Solar flux indicates the degree of ionisation in the earth's atmosphere and the K index measures the activity of the earth's magnetic field or any possible magnetic disturbance

In general, the higher the value of solar flux and the lower level of magnetic activity, the better the HF bands will be for DX, and the reverse if the flux number is low and the magnetic activity high. During April a Solar flux number of 67 was Use the following procedure in applying the use

of Fig. 1. Assume that WWVH broadcast repor flux number of 80 and a K index of 2. The intersection of these values within the area de-fined as "high normal" is the result, and it could be worthwhile to expect some reasonably good HF DX. If a flux of 70 is reported with a K index of 5, one may as well be in the garden or watch-ing TV or doing that job that has been outstanding for years. Use the same method of application to the

graph, if instead of the K index you have index figure, e.g. Solar flux of 70 and A index of 5 or less, the band is worth watching.

The diagram and detail shown in Fig. 1 can be put to use by the VHF fraternity who are interested in DX. When the flux reading, and the A index figures take the propagation conditions into the below normal or disturbed area, there is a good chance that unusual propagation may occur on the 50 and 144 MHz bands, As Auroral conditions usually accompany radio storms, they could produce some sporadic-E ionisation. Accordingly. there is good reason for the VHF operator to daily check the WWV/WWVH broadcasts. Waiting for the information over the VK2 broadcast will be use-less; the information must be obtained daily and checked against Fig. 1, as VHF operators are aware that they have to watch the band for the openings. The use of the information from WWVH could be very helpful, so it could be that an amatour who uses the HF and VHF bands, may not have to be occupying himself in some other chore, after all. However, as IPS have told me, there is still a

lot to be learned on what goes on in the ionosphere and things happen which are completely unex-pected and nothing appears on the scientific information available to indicate what is happening. Such an occurrence was on April 17. It is a long time since I have heard the band full of European signals on 14 MHz short path in the mornings, yet when turning to that band at 2100 GMT, it was full of them and one only had to send a callsign and they were at you like a swarm of bees. Yet the flux number was only 69. of bees. Yet the flux humber was only 69. I only wish now I had kept a record of the A index for that day. By 2200Z, the band had changed and the US stations were coming through full bore. nean

In respect to the A index, the following applies: Figs. 100 to 400, impossible conditions; 30 to 40, poor to fair; 15 to 30, fair; 0 to 15, good to excellent. For those who may not be aware of this, over the

weekly broadcast by the VK2 Division, as well as the recent introduction of the flux figures for the preceding week, the IPS provide information of what transpired in the past week and what may be expected in the week to come, such as 'a recurrent disturbance is due to start on a certain date' or may be a sun spot has appeared, or flares occuron certain times of a particular day.

WWVH, after giving the flux number, give the support activity, index etc at the current time and then a forecast for the next 24 hours, but no amateurs have the equipment to cover WWV/ WWVH, so the next bet is the VK2 broadcast. It is well that amateurs be aware of the differ-ence between a sunspot and solar flare. Solar flares do not always occur near sunspots, and

they occur only in the day time. A flare causes greater absorption and may be accompanied by emission of solar particles or so-called 'magnetic storm particles' and these arrive at the earth one to two days after the occurrence of the flare and have the magnetic storm, ionospheric storm, etc. The most prominent occurrence with this type of

storm is a reduction in the MUF and an increase in the absorption, which in effect means a nar rowing of the useable number of DX bands, so 3.5 and 14 MHz can be affected. During recent months, the most reliable band for DX has been 7 MHz but even if has shown adverse propagation at times. The areas worst affected at this time are the Geomagnetic poles and auroral zones. For those who have just started their 'DX careers' and are somewhat disheartened when they

hear old timers talking about the DX they have worked and the newcomer has never heard such station, they can take some heart from knowledge that a sunspot cycle rises much faster than it falls. Just think of a graph and the leading side is much steeper than the falling side, so once we do reach the bottom of the present cycle, No. 20, you can watch the DX come back again. But if we are in for another small cycle it won't be too good

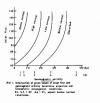
too good.

I am fortunate in having, due to my fellow 'stu-dent' of sunspot activity, K46SU, obtaining it for me, a copy of some 'good gen' from the US Dept of Commerce. There is far too much to include in this article, but if any one is interested, they can write to:

US Department of Commerce, National Bureau of Standards Boulder,

Colorado USA 80302; and ask for their literature NBS special publication 236 and a copy of the paper by K. D. Boggs, Ionospheric Forecaster, Spectrum Utilisation Divi-

One final word. Most of the information i gated by WWV/WWVH is for the North Atlantic area, but can be put to good use by radio



amateurs in Australia

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Model 2020 de-luxe all-band AC-DC transceivers External VFO model 8010 for the 2020 External speaker for model 2020 TRIO-KENWOOD	\$550 \$100 \$25	Helical 6' long High power KW-40 for 40 M. High power KW-40 for 40 M. Tri-band HW-20 for 20 M. Swivel mobile mount & chrome plated spring for all	\$25 \$16
Model TS-900 de-luxe all-band transceivers, with PS-900 AC supply-speaker unit	\$800	ASAHI MOBILE ANTENNAS	
Model TS-520 AC-DC transceivers all-band Model TV-502 2 Mtr transvertor for TS-520 QR-666 all-band coverage receiver 170 KHz-30 MHz YAESU-MUSEN	\$530 \$200 \$300	Model AS:303A set of 5 whips 10 to 80 M. complete with ball spring and mount AS:2:DW:E ½ wave 2 M. mobile whip AS-WW ½ wave 2 M. mobile whip AS-GM gutter clip mount with cable and connectors	\$90 \$8 \$15 \$10
Latest model FT-101-E AC-DC transceivers with genuine RF dipper-speech processor Model FT-200 transceivers with FP-200 AC unit	\$650 \$400	M-RING body mount and cap for 2 M. whips CUSH CRAFT ANTENNAS	\$5
Model YC-355-D digital frequency counters 0-200 MHz SPECTRONICS DD-1 digital counter for FT-101-B-E	\$250 \$150	Model DSPA 52 to 27 MHz adjustable ground plane LAC-2 lightning arrestors Model AR-2 R1 MGO % wave verticals AR-2X R1NGO double % waves verticals	\$25 \$6 \$20 \$35
All UNIDEN, TRIO-KENWOOD & YAESU MUSEN ceivers come complete with original English manu crystals for all available bands and a P.T.T. dimicrophone.	als, all	ARX-2 extension for AR-2 A147-20T combination vertical-horizontal 2 M. Yagis, 10 elements each A147-11 11 elements 2 M. Yagi	\$15 \$60 \$30
HY-GAIN ANTENNAS		CRYSTAL FILTERS	
14AVQ 10-40 M. verticals 19' tall, no guys 18 AVT-WB 10-80 M. verticals, 23' tall, no guys TH 3 JR 10-15-20 M. junior 3 el Yagi 12' boom TH 6 DXX 10-15-20 M. senior 6 el. Yagi 24' boom	\$65 \$90 \$135 \$225	9 MHz similar to FT-200 ones, with carrier xtals FDK MULTI-7	\$35
204 BA 20 M. monoband 4 el. TIGER YAGI 26' boom HY-QUAD 10-15-20 M. full size Cubical Quad CDR ANTENNA ROTATORS	\$190 \$200	2 M. FM transceivers, 10 W output, now with 12 A channels crystals, 40 to 60, including channels 43 a includes all repeaters and anti-repeater use, still Spare Mobile Cradle and Power Cord	
AR 22 for 2 and 6 M. and small HF beams HAM-II with re-designed control box	\$50 \$165	KEN PRODUCTS	
All three models for 230 V AC complete with ind control units. 4. conductor light cable for AR-20-22 12-conductor light cable for HAM-II 80 cents pr 8-conductor heavy duty cable for HAM-II 60 cents pr	licator- er yard er yard	KP-202 2 M. hand-held transceivers with 6 channels KCP-2 charger for KP-202 with 10 NICAD batteries Stubby flexible whip for KP 202 KP-12A speech processor, self contained 240 V AC	\$150 \$35 \$6 \$100
BARLOW-WADLEY RECEIVERS		KLM ELECTRONICS	
Model XCR-30 Mk II 500 KHz to 31 MHz cont overage portable communications receivers, controlled reception of AM-USB-LSB-CW	crystal \$275	Solid state 12V DC 2 M. amplifier, 12W output, auto antenna change-over when driven, ideal for mobil with the KP-202	e use
S.W.R. METERS		NOVICE LICENSEES EQUIPMENT	
Midland twin-meter model for 52 Ohms, up to 1 KW on HF TEN-TEC	\$22	5 W AM 23 channels 27 MHz transceivers with P.T.T. mike 5 W AM 15 W SSB 23 channels transceivers with P.T.T. mike	\$95 \$175
Argonaut New Model 509 5W PEP All Band 12V SSB-CW Transceivers all solid state	\$300	COAX CONNECTORS & SWITCHES	
POWER SUPPLIES		VHF types PL-259, angle and T-connectors RCA models \$1.20 3 Position Coax Switch	ale 5 each \$8

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A CLEARANCE SALE will be held during NOVEMBER-DECEMBER 1975 of all stock listed on the adjacent page.

A BLANKET DISCOUNT of 5 PERCENT will apply during this period until CHRISTMAS 1975 on all items on the adjacent page's list.

NO, no termination of business, although if anyone wants to buy my retail business, he is welcome to negotiate. This is just prior to a re-organisation for 1976 and onwards.

MULTI-7 2 M. Transceivers, now all crystals available for all AUSTRALIAN channels, repeaters 1 to 7 inclusive plus all anti-repeater operation crystals and channels 40-50-52 transceiver crystals. In all 17 Channels now!

Also all crystals for KEN KP-202 repeaters 1 to 7 incl. Crystals are still \$4 each

FURTHER SPECIALS OUTSIDE THE 5 PERCENT DISCOUNT LIST!

Near new DRAKE R.4-C and T-4.XC receiver-transmitter combination. The R.4-C receiver is complete with 15 extra crystals, the MS-4 speaker, further a TV-1000-LP filter, MN-2000 antenna matchbox, Shure microphone, in all a super-de-luxe combination for \$1200.

HY-GAIN Model LP-1017 Log-periodic beam, covering 6 to 30 MHz continuous, 36 ft boom, 40 ft longest element, 14 elements, 320 lbs weight with the HY-GAIN Model R-3501 rotator for this beam, 330 lbs weight, the lot for \$3,000

LINEAR AMPLIFIERS

ALPHA 374 brand new linear\$1,100
ALPHA 70 linear
HENRY 2K Ultra linear complete with HENRY POWER-SUPPLY
HENRY 2K Litra linear with locally made power-supply

ARIE BLES VK2AVA

P.O. Box 23, SPRINGWOOD, N.S.W. 27777



Page 14 Amateur Radio November, 1975

LOUDSPEAKERS AS MICROPHONES

Alan Renton, VK4AZ

The Manse, 13 Herbert St., Proserpine, Qld. 4800

Recently I was given for my junk box a dynamic microphone which had been through a cyclone. I salvaged the transformer and was interested to see that in conjunction with loudspeakers from both valve and transistor radios, the resulting combinations were quite sensitive

Then I decided to see whether I could dispense with the microphone transformer and instead use the output transformer, that had originally taken the output of a 6V6GT, coupled to the loudspeaker of a mantel radio. The loudspeaker was an ancient 6 inch 3.5 ohm Rola.

Using this loudspeaker plus its own transformer as a mike, I connected it to a Philips (valve type) tape recorder. The sensitivity was very much greater than the rather high quality dynamic mike that I normally use, Indeed, we were able to get quite good recordings of frogs, crickets etc., from the window of the house. The quality of the reproduction was reasonably

good.

Later I disconnected the loudspeaker plus transformer from the tape recorder and connected a 20k ohm per volt multi-meter across the transformer. I was able to get an output of one volt by speaking into the loudspeaker in a reasonably loud and low tone of voice.

Then I tried using the combination as the microphone for my FT200 transceiver. I adjusted the ALC so that its output was comparable to the usual dynamic mike.

Two amateurs, one in South Australia and one in Southern Queensland gave me reports comparing the loudspeaker with the dynamic mike. The VKS reported that the speaker was slightly more bassy but that it would serve very well as a stand-by mice. The other amateur actually thought that the other amateur actually thought that the

The other amateur actually thought that the speaker gave an improved performance. The speaker was not in an enclosure and even had a 1½ inch long tear in the diaphragm!

Perhaps the above may be of use to young amateurs with strained finances or to any who might be looking for a very sensitive microphone at short notice.

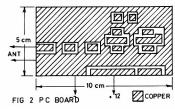
QRP CW RIG FOR

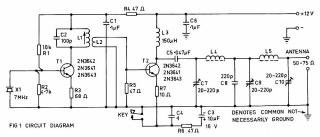
O IVELEZ

Drew Diamond VK3XU 55 Winbirra Pde., Ashwood, 3147

Presented here are all the details of a simple low-power CW transmitter for the experimenter. Interstate contacts have bren made with this transmitter and an ordinary inverted-Vee dipole antenna. Power output is about 500 mW linto 80 owns from a 12 voll supply. The transistors used are cheep (about properties) and the properties of the contact of th

The photograph shows the form of construction used, a small fibreglass board







Peter Williams VK317 Manager

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WHY 11 GOOD FEATURES RECOME 11 GOOD REASONS WHY YOUR NEXT (OR FIRST) HE DIC CHOILI D DE V "3030

HF	KIG SHOOLD BE A	2020		
		UNIDEN 2020	BF	AND
	Air cooled final	Yes	Yes	Yes
1.	Transmitting tubes in	1 65		
2.	final (6146B)	Yes	No	Yes
3.	CW filter as standard	Yes	No	No
4.	Regulated screen voltage		140	140
**.	for stable operation of	les		
	final	Yes	No	No
5.	Independent rf circuits		140	140
5.	for Tx and Rx	Yes	No	No
6.		1Z or	140	140
0.	1kHZ	Yes	No	No
7.	Slow/fast AGC switch	Yes	No	
8.	PLL VFO for excellent	1 65	140	yes
0.	stability and tracking			
		Yes	No	No
	linearity Noise Blanker for pulse		NO	140
9.		Yes	Yes	Yes
	type noise		Tes	T es
10.	Hybrid dial with digital			No
	analog read-out	Yes	No	No
11.	RF amp and fan switch			
	when receiving only - a			
	desired	Yes	No	No

29.0 ~ 29.5 295 - 300 27.0 ~ 27.5 Receive only 15.0

Bands (maters)

10(C)

ww-

The 12th feature is the price - \$550!

The 2020 does not have 160 metre coverage but there is some scope to bring a little "do-it-yourself" back into the shack — why not make a transverter connections for transverter operation are on the rear panel.

Receive only

LINEAR AMP	? Keep posted on a mat	ching linear for early release in 1976
Bands (meters)	Frequency(MHz)	Tubes6146B2
80	3.5 ~ 4.0	128Y7A1
40	7.0 - 7.5	Transistors 52
20	14.0 ~ 14.5	FETs 16
15	21.0 ~ 21.5	ICs18
10(A)	28.0 ~ 28.5	Diodes154
10(8)	28.5 ~ 29.0	

DISTRIBUTORS:

32 Kalgoorlie Crescent, Fisher, Phone: (062) DR Flectronics 21 Christine Ave. Miami. Phone: (075) Graham Stallard, 27 White Avenue, Lockleys, Phone: (08) 43-7981 Girtonics, 188 Parry Street, Newcastle. Phone: (049) 69-2040. Perth: ics. 388 Huntriss Avenue, Woodlands, Phone: (092)

SO WHAT'S WITH THE PLL BIT?

We have taken an output frequency of 7MHz as an example and the relevant frequencies to eventually generate 7MHz are shown on the diagram The 9.138 MHz signal from the VFO is fed into the mixer in the PLL system. Here it is mixed with the 5.838 MHz signal from the VCO (voltage controlled oscillator) to produce an output frequency of 6.7MH-

2. The 6.7MHz signal is passed to the programmable divider where it is divided by 67 to produce a 100 KHz signal which is passed to a phase detector (P/D).

In the phase detector the 100 KHz signal is compared with another 100 KHz signal derived from a highly stable 10MHz crystal oscillator

The output from the P/D (an error voltage if one exists) is then fed back to the VCO to lock it precisely to 15.838 MHz.

This output of 15.838 MHz is fed to the local oscillator mixer where it is

mixed with 29.025 MHz from the band oscillator circuit. This produces a 13.187 MHz signal which is then fed to the transmitter

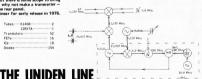
or receiver mixer where it is mixed with the ssb signal generated at 6.187 MHz to produce the final output of 7MHz. For other bands, a different band oscillator crystal is used, and to generate the 100 KHz segments within a band, the program on the

divider is altered so that the divider's output is still 100 KHz. Thus the 2020 has the stability of the 10MHz reference oscillator. So much for the example given: of somewhat more practical interest is the sequence of events if the tuning knob (VFO) is turned — a reasonable state of affairs if we are going to tune the band! The following explanation also

annlies if the VEO or VCO tends to drift. When the VFO frequency is varied, the programmable divider is presented with a frequency other than 6.7 MHz. Hence its output will not be exactly

100 KHz. This produces an error voltage from the P/D which shifts the VCO such that a difference in frequency between the VCO and the VFO is exactly 6.7MHz. Naturally all this takes place with the speed and agility of a startled gazelle! i.e. instantaneously. For other bands, different local oscillator frequencies are employed, and a different frequency is presented to the divider.

However the principle is exactly the same as described above. Peter Williams, VK317









VICOM VICOM





Peter Williams VK3IZ Manager

Telex: AA30566, Cables & Telegrams: "VICOM" Melbourne.

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IC-202 144MHz SSB CW 3W

TRANSCEIVER \$199 \$199

For the first time! PERSONAL/MOBILE/BASE 2M SSR There have been 2m ssb mobile/base units — large. Features:

weighty and expensive! Now from the best known * solid-state T/R relay and specialist VHF manufacturer ICOM, comes the * PA protection IC-202 - small, light weight and only \$199. FEATURES:



* 5 helical resonators

* 10/1 watt

Complete with cables, mobile bracket, mic, manual and 6 channels from the WIA Bandplan.

Coverage 144-145MHz:

144.0 - 144.2/144.2 - 144.4 (crystals provided) Provisions for other crystals (200KHz per xtal).

- VXO operation giving 200KHz with excellent stability. pep output 3 watts.
- cw output 3 watts.
- RIT tuning : 3KHz
- noise blanker. receiver sensitivity 0.5 uV (S+N)/N 10dB
- receiver selectivity 1.2 KHz 6dB 2 4KHz - 60dR
- aduio output 1 watt
- battery external supply 13.8V @ 15%. Provision for internal dry cells or nicads. Size 183 x 61 x 162 mm. mass 2 Kg.
- current drain max ssb 540ma Tx, 90ma av Rx. Complete with mic, manual, carry-strap, dry cells and the VICOM 12 month *

warranty.



Hot off the ICOM production line comes the 2m hase station. Featuring 145 semiconductors, this new rig will sell for around \$500 and will be available early 1976.



144MHz SSB CW FM 10W TRANSCEIVER ARRIVING SOON!

12 month warranty on all ICOM

The IC21A is the 10 watt base station or mobile (146-148MHz) with variable power control, adjustable deviation, 24 channels, built-in discriminator meter, S meter, power/swr meter, PA protection and modular circuitary . . . In addition:

low intermed, due to MOS-FET RF amp and 5 helical resonators calibrate position netting switch allows the IC21A

to listen to itself on simplex channels. The RIT control offsets the receiver frequency to bring in signals which are not properly calibrated

runs from either 240V or 13.8V complete with mic, cables, manual, 3 channels and the VICOM 12 month warranty. PRICE: \$208

The DV-21 PLL Digital VFO is a unique synthesiser to complete your ICOM 2M station (it can also be interfaced with other rigs). Runs from either 13.8V or 240V and can scan either empty frequencies or those being used. In addition, two programmable memories for favourite channels can be selected. PRICE: \$285. DV21 COMBINATION DEALS:

IC22A plus DV21 \$450 IC21A plus DV21 \$570

WIA Band Plan Xtals for IC22A/IC21A Reneaters 1-7

Anti-repeat 1-7 \$8.50 pr Simplex: 40, 49, 50, 51, 52, 53,

(\$1 P&P)

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Peter Williams VK3IZ Manager

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NEW FROM OM70 PRODUCTS!

HIGH POWER 2M TRANSVERTER - 28/144MHz. Modes cw. ssb, am, fm. Input drive 0.5 watts rms, 1 watt rms max. Power requirements - normally from hf transceiver, FT101. UNIDEN, etc. Size 9½ x 5 x 6 inches.

PRICE: \$199.

SOLID-STATE TRANSVERTER - features 12v negative earth. G8AEV converter, 2rf and mosfet mixer. Output power is 2 watts. Size 10 x 5 x 2 inches. Sufficient output to drive 6/40 to 203BA 3el 20m beam \$168 full ratings.

PRICE: \$105 2M SOLID-STATE LINEAR

Give that extra punch to your IC-22A, Liner-2, FT221, etc. Features fm, am, cw, ssb with adjustable hang time. Drive power is 2 watts rms (minimum) 10 watts rms (maximum). Output 50 watts rms max into 50 ohms. Supply current 6 amps.

PRICE: \$102.

70 CM TRANSVERTER Accepts low power ssb from hf transceiver between 28 and 30 MHz, and transverts to an output between 432 and 434 MHz at

Built-in converter so that 432 MHz rx is converted to 28MHz. Features input power up to 1 watt max and output power 10 watts rms (26 watts pep typical). Size 10 x 5 x 2 inches, sockets

BNC PRICE: \$168.

ALSO AVAILABLE: 432MHz linear amp using 2c39A - power supply required. Output power 50 watts, circuit stripline cavity using the valve in grounded grid. PRICE: \$70.

TRANSCEIVERS ıniden

Uniden 2020 (80-10m) transceiver, \$550 incl. mic Uniden External (PLL) VEO \$105 Uniden Matching Speaker

Yaesu FT101E (160-10m) transceiver \$660 @ Yaesu FL2100B Linear Amplifier \$388

Yaesu FT75B mobile transceiver, \$245 Atlas 210-215 solid-state transceiver, \$570 Atlas 240V power supply, \$150

Atlas delux mobile mounting bracket, \$47 70 cm The SU-710cm fm transceiver runs 10

watts and is the ideal mobile rig. Complete with 1 channel (435.0) and mounting bracket, mic, cables etc., and VICOM

90 - day warranty. §

WARRANTY

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MOBILE WHIPS:

RM-80 Resonator for 80m, \$18.50

RM-40 Resonator for 40m, \$16.80 RM-20 Resonator for 20m, \$13.50

BM-1 Bumper mount \$13, Spring \$13 HY-GAIN

TH6DX 6el vagi 10-15-20, \$225

TH3.IR 3et vagi 10-15-20, \$135 18AVT trap vertical 80-10, \$90 14AVQ trap vertical 40-10, \$65

VHE ANTENNAE LINDENOW 2m 5/8 whip \$21, base \$2.60.

RINGO ARX-2 6db 2m gamma matched vertical \$35. Extension kit to improve gain of the old AR-2, \$12,

ANT. ACCESSORIES

Rotator - CDR ham II 240v \$165. Oskerblock SWR200 SWR/PWR

ranges 2/20/200/2000w to 200 MHz

METRES FM

Seiwa SV230 2 metre FM 12 channel transceiver featuring 25 watt/1 watt power switch, priority channel system and internally mounted deviation control, Sensitivity is .5 uv or better for 20 db quietening. Adjacent channel rejection is 70 db or better. Fitted with channels, 1, 4, and 50, \$198 -

KEN KP202 handheld 2 watts. Incls 4 chs \$150. Charger and nicads \$32

Trio 7200G 10 w incl 2 chs Special \$210

TEST GEAR

available ex-stock.

TRIO VT108 FET VOM 8 ranges 0.5 to 1.5kv, 11 meg input. ims 0.1 to 1000 meg, memory feture \$85 TRIO AG202A AUDIO GENERATOR covers 20Hz to 200 KHz 10v rms output, sine and sq wave, ext sync \$94

TRIO 75mm scope 20mv cm sens, dc to 1.5 MHz \$170 TRIO SG402 RF GENERATOR covers 100KHz to 30MHz \$76

D-60 FREQUENCY COUNTER including 2 metre prescaler \$360

HAM HEADQUARTERS

pcb mount proportional control crystal

VICOM VICOM

ovens can be supplied for standard temperatures and voltages. Model PCL1-12 clip type oven for He-25/u crystal \$19.80 Model PCL2-21 slip-on oven for Hc-6/u crystals \$19.80

Apart from local inflation, shipping charges and (in particular) domestic Japanese prices have increased together with a gradual decline in the Yen. As a result some of our prices may increase in the next few months as current stocks are depleted.

10 x 5 cm. The components are soldered to the copper side of the board and drilling is unnecessary. Coax to the antenna connector is soldered to the left hand side of the board shown on the photograph. Tag board construction or matrix will also yield satisfactory results if circuit board working facilities are not available

The toroidal coil formers used at L4 and L5 are not easy to obtain, as it is necessary to order a minimum quantity of ten from the supplier. (I bought a number of these formers for this project and will be pleased to post a pair to any intending constructor for the price I paid, 40c plus postage

Any active 7 MHz crystal in the CW band (7000 to about 7040 kHz) may be used at X1. Operation of the crystal oscillator can be checked before the components of the output stage are soldered into place. Tune the station receiver to the crystal frequency and adjust L1 for maximum signal consistent with re-starting of the oscillator with removal and re-application of the 12V supply. The components of the output stage can now be mounted into place.

To test the completed circuit, connect a 6 volt. 100 mA lamp across the output, or better still, a 56 ohm 1 watt resistor and X10 probe and CRO, with a bandwidth greater than about 10 MHz. With the key circuit closed, adjust L1, C7, C9 and C10 for maximum output. The lamp should glow at almost full brightness when the circuit is operating correctly. The character of the keying may sound a little chirpy with the lamp load, but that is because the load variations of the lamp are reflected through the output stage to the oscillator. With a pure load (resistor or antenna) there is no chirp and keying sounds quite good.

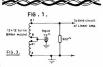
If you have been using high power and feel you need a little adventure, this little QRP rig may provide it.

DERAND RF TRANSFORMER

Ivan Huser VK5QV 5 Mugford St., Mount Gambier, SA 5290

A transformer suitable for matching the input of a passive grid linear amplifier to a transmitter or transceiver.

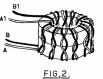
If one looks at the circuit diagrams of passive grid linear amplifiers it will be seen that the input swamping resistor is generally in the order of 300 ohms. Thus, if fed by coax directly from a transmitter or



transceiver, a mismatch will occur with a resultant high standing wave ratio between the two units

This problem can be overcome by using an RF transformer having a 2:1 turns ratio (4:1 impedence ratio) between the input socket of the linear amplifier and the swamping resistor in the tube grid circuit.

If 75 ohm coax, is used, a swamping resistor of 300 ohms will give an SWR of 1:1 on all bands. For 50 ohm coax, a 220 ohm resistor should be used.



The construction of the transformer is quite straightforward. The original was wound on two Ducon Q2 ferrite rings having an outside diameter of approximately 18 mm stacked one upon the other.

Two lengths of 7/.0076 PVC hook-up wire were twisted together to give about two twists per inch length as shown in Fig. 1. The twisted pair was then wound tightly around the toroid to give ten or twelve turns (see Fig. 2). The exact number of turns does not appear to be too critical.

If two different coloured wires are used. it becomes a relatively simple task to connect the transformer as shown in Fig. 3, It should be noted that this transformer is NOT a balun since both the input and output are unbalanced. Although not tried on 160m, I can see no real reason why it should not work satisfactorily on this band alen

Mounting and/or potting of the transformer is left to individual tastes.

This transformer would be quite suitable for use with the G2DAF/VK5MS linear amplifier described in the May 1974 issue of Amateur Radio.

> Hans Smit VK2RHS 9 Moore Cres., Faulconbridge, NSW 2778

IMISE YOUR 14AVQ

The ubiquitous 14AVQ trapped vertical antenna can be optimized for operation on five Australian bands quite easily with two simple modifications. 1. Shorten the distance between the 10

metre trap and the 15 metre trap to 51/2

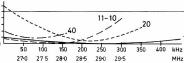
inches. This involves cutting about 2 inches off the connecting tube and about 1 inch off the bottom of the 15 metre tran 2. Lengthen the top section to allow it to be

adjusted to 78 inches, Insert an extension piece (flat 1/2 inch plated steel bent at each end and drilled, about 4 inches long) between the top section and the capacity hat. Bend the three aluminium wires up, to add a further 5 inches of height to the antenna.





instruction leaflet, A - 29 in, B - 71/2 in. C - 12 in, D - 51/2 in, E - 12 in and F - 78 in (plus the additional 5 in. gained by bending up the capacity hat wires). Make sure that the ground system is



effective. If you have a flat steel roof, as is the case at this QTH, solder all the sheets

together with short lengths of braid or thick wire. The following SWR curves were obtained with the bottom of the antenna mounted

NEWCOMERS NOTEBOOK

Rodney Champness VK3UG and David Down VK5HP

A NOVICE TRANSMITTER — Part 3

The transmitter has been designed so that the modulator can be added at any time to the basic CW transmitter. The modulator described in this article is capable of putting out about 8 wasts of audio which will input of 12 watts to the plate and screen of the output valve. However, the DC input to the final consists of the DC used in the acreen as well as the plate circuit. See the contract of th

in the plate circuit.

The modulator can therefore not be expected to modulate a transmitter with more period to modulate a transmitter with more modulate in the modulate is capable of modulating the carrier to 120 per cent in the positive direction and 85 per cent in the negative direction, and 85 per cent in the most we direction, which means the transmitter is more effective than some other transmitters of considerably higher power.

The audio quality of the modulator is quite satisfactory and the distortion figures come out at 8 per cent, which is quite acceptable for a piece of equipment in this category. A ceramic microphone is used to maintain the overall speech quality. The frequency response of the modulator has been tailored to be substantially flat from 300 Hz to 3000 Hz and is down by about 6 dB at both of these points relative to 1000 Hz response. The components resnonsible for the speech frequency shaping are C14, C15, C16, C17, C18, C19, C20, C22, R18, R23, and R24, For example C14 and C15 have opposite effects on the frequency response of the particular stage -C14 with R18 acts as a low pass filter attenuator, whilst C15 with R20 acts as a high pass filter and attenuates frequencies below about 300 Hz. C14 also acts as an RF bypass in the front of the modulator.

Valve stage V2 amplifies the weak signals produced by the microphone by about 300 times and then applies these to the modulator output stage V3. These voltages are built up in this stage to approximately 500 volts peak to peak, enough to fully modulate the RF section of the transmitter. All the DC valve operating parameters were extracted almost entirely from the various valve data books; the signal coupling components are the things which were calculated for this particular amplifier/modulator requirement. The modulation transformer is a push-pull speaker transformer of the cheaper replacement type rated at about 5 watts. Approximately 300 volts DC is placed on the plate of the 6BQ5 modulator valve. When it is driven by the 6AU6 the plate current is made to fluctuate at an audio rate When the input voltage to the grid of the 6BQ5 is swung in a positive direction, this causes the plate current to increase because the valve has less bias. As this action is occurring at an audio rate the transformer T1 acts as a choke at audio frequencies preventing the valve from drawing much more current than normal, and by so doing the plate voltage drops to a low value - theoretically to zero. However, when the drive from the 6AU6 is in a negative direction, the valve will tend to cut off and T1 again acts as an audio choke but in this case it tries to maintain the current drawn by the 6BQ5 at a constant rate so the voltage at the plate end of the transformer increases to something like 600 volte This swing from zero volts to 600 volts

at the modulator plate end of the trans-

former does not in fact occur if the modulator valve is to be operated in Class A1 which it is in this transmitter. The voltage swing is limited to 60 volts DC to 540 volts DC, which works out to a swing of ± 240 volts about the 300 volts DC at the plate of the modulator. If the swing is only 240 volts either side of the resting DC voltage, it is necessary for the transmitter RF section to be supplied only with 240 volts DC HT voltage otherwise 100 per cent modulation will not occur. The DC voltage must be swung between zero and twice supply by the modulator audio output, and this is approximated in this transmitter. To accomplish this it is necessary to drop the HT voltage on the RF output stage to 240-250 volts and R28 does this. The 480 volts peak to peak audio must not be attenuated by R28 so C22 bypasses this resistor to make sure the peak audio is applied to the final RF valve. T1 is a 1 to 1 speaker transformer. The DC currents in T1 are in opposite directions so their magnetising currents largely cancel and T1 does not become magnetically saturated. The secondary winding on T1, the normal speaker winding of 3.5 ohms, is used for monitoring purposes in the companion receiver sec-

Some may think that the relay shown in the circuit diagram of the modulator serves no useful purpose - but it does. In conjunction with R27 the relay shorts out the electrolytic canacitors in the modulator and receiver on changeover from transmit to receive and vice-versa. If these capacitors are not shorted out on changeover enough charge will be left in them to cause both transmitter and receiver to operate momentarily together and probably cause some acoustic feedback. The time for C21 to discharge through R27 is of the order of 0.1 milliseconds with a value of 10 uF for C21. The momentary discharge current through the relay contacts and the resistor is of the order of 2.5 amps. Without the resistance the relay contacts could easily weld themselves together, so it is not recommended to delete this seemingly insignificant resistor. It may be that in some cases this anti-acoustic feedback circuit is not required

Press-to-talk facilities for the transmitter are extended via the microphone to the plug and socket and then to relay control circuitry which has previously been described. At this juncture it is probable advisable to point out that the terminal strips labelled STR1 in the transmitter and modulator circuit diagrams are meant to make i.e. A connects to A.

mate, i.e. A connects to A, etc.

The voltages which will appear in the modulator are tabulated below:—

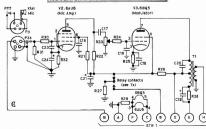
 Valve
 Cathode volts
 Screen volts
 Plate volts

 6AU6
 +1.5
 +85
 +45

 6BQ5
 +6.8
 +250
 +300

These voltages are subject to variation due to component variations, supply voltage variations and individual valve variations, but are near enough for practical purposes.

MODULATOR FOR 10 WATT TRANSMITTER.



The next two months should finish the transmitter description, and will include a practical chassis layout, any modifications to the transmitter which may improve its performance, or extend it, and a simple aerial tuning unit which may be useful.

COMPONENT LIST FOR MODULATOR OF THE 10 WATT 80 METRE NOVICE TRANSMITTER

R21 — 1M ohm ½ watt, screen voltage dropping resistor.

R22 — 0.47M ohm ½ watt, plate load resistor, valve output voltage is developed across

valve output voltage is devalor resistor, valve output voltage is devaloped across this resistor.

R23 — IM ohm potentiometer, gain control for the modulator. A fixed resistor can be used here if R24 connects to C17. This is the

grid return resistor.

R24 — 100k ohm 1/2 watt, grid stopper and part of

audio low pass filter.

R25 – 155 ohm i watt (2 x 270 ohm ½ watt in parallel) carbode bias resistor.

R26 – 10k ohm 1 watt, HT decoupling and voltage dropping resistor.

R27 - 100 ohm ½ watt, used to discharge receiver or transmitter HT line to earth when particular section switched to stand-by. Value not at all critical, up to 1k ohm satisfactory.

R28 — 1k ohm 3 watt wire wound resistor or 3 x 2.7k ohm 1 watt resistors in parallel. HT voltage dropping resistor for PA valve. R29 — 39 ohm (2 x 82 ohm 1 watt in parallel or a 6.3 volt 0.15 amp pilot lamp). Used to balance the voltage across the seriesparallel valve heater network. R30 — 100k ohm ½ watt grid stopper and portion

no dudic low pass filter. Also acts as a suppressor to RF vollages and currents being impressed on the grid of V2 and so causing audio distortion.

R31 — 2.2m ohm ½ watt, grid return resistor for V2 and load for the high impedance micro-

phone.

R32 — 2.2k ohm ½ watt, cathode bias resistor for V2.

C16 — 0.022 uF 400 volt polyester or similar capa-

citor. Screen bypass, value helps with the shaping of the modulator audio passband.

C17 — 0.001 uF 400 volt polyester or similar, coupling capacitor from V2 to V3, acts to restrict the low audio frequencies pass

sing through the modulator.

C18 — 390 pF ceramic disc capacitor, used for frequency shaping, restricting the passage of highs through the modulator.

C19 — 5 uF 25VW electrolytic, cathode bypass, used to attenuate the lower frequencies.
C20 — 0.01 uF 400 volt polyester or similar, used to attenuate the higher audio frequencies, can be omitted from the circuit with no problems.

C21 — 4 UF to 24 UF 350VW electroylic, HT bypass to prevent feedback in the modulator and reduce hum on the modulated signal. C22 — 4 UF 160VW electroylic, passes audio around DC dropping resistor R28, improves modulation percentage of the transmitter, also restricts the passage of the flower C23 — 350 of peramic disc capacitor, used for

audio frequency shaping and bypassing of RF induced into the first audio stage from transmitter. C24— 1 uF 10VW electrolytic, cathode bypass for V2, aids in attenuating the lower audio

frequencies.

J3 — 5 pin miniature socket for the PTT microphone.

P3 — 5 pin miniature plug to sult above.

XM1 — Crystal, ceramic or high impedance dy-

namic microphone with press-to-talk facility.

V2 — 6AU6 high gain sharp cut-off pentode valve.

V3 — 6BO5 high gain audio output valve.

T1 — 10k ohm plate to plate replacement pushpull speaker transformer. Exact impedance

not over Important.

REL — See transmitter details in September issue.

Miscellaneous hook-up wire, tag strips, solder, shielded cable, nuts and bolts, valve sockets, metal for chassis and brackets, labels and paint, also required.

so who needs a power generator for amateur radio?

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Size of Unit.

20 Years Ago

with Ron Fisher VK3OM

NOVEMBER 1955 'Nation Shall Speak Peace Unto Nation', The late

On Knock WC2NO suggested that perhaps instead of super power broadcasting stations taking up shortwave space, more frequency space should be handed over to amateurs so that the youth of all nations could do just this.

From the technical point of view, the November issue belonged to Hans Ruckert VK2AOU. Part two of 'A Transmitter With Low Harmonic Output you 'An IT VIF litters for the Amateur Transmitter'. Hans showed how to design and align low pass filters suitable for connection in the output coax line of a typical amateur rig, plus information on the design of AC line filter.

Back in 1955, VHF receivers did not usually include automatic band scanning. However, not to so outdone, Dr. H. A. F. Rode VK2HE attached an AGC controlled motor to the tuning dial of his receiver. The whole thing was described in an article entitled 'A VHF Automatic Tuner'.

Most amateurs give little thought to lightning protection until it is too late. An article reprinted from QST gave examples of just what should be done to avoid serious trouble. An interesting account of the formation of a

An interesting account of the formation of a communications net for the marathon events of the forthcoming Olympic Games showed just what could be achieved with two metre gear at the time. I am not sure if the not actually operated during the games or not.

If you follow the Hamads column try a few of these from November 1855. An AR7 complete for \$70. Or how about an RAAF scope for \$30. No, well perhaps you could be tempted with five 825 tubes at \$2 each.

IARU NEWS

Word has been received that the Minutes of the Region 3 Hong Kong Conference have been completed and are on the way to us by see mail. All the more important items are likely to have been cealt with already at the 1975 Federal Convention. The NZART Golden Jublice will be marked next and the control of the control of the control of the 4th to 7th June, 1976. If any amateur has plans to visit New Zealand.

If any amateur has plans to visit New Zealand isome time or other, maybe noxt year", or linded intends to visit Kiwiland next year aryaway, the A world renowed Scientist will be a guest lecturer, there are social evenings and luncheons, a mobile raily, fox hunt, ocach tours around New Zealand before and after the conference, and even a crecked for children.

with the federal devaluation of the New Zeasino dollar this is certainly a popular holiday area nowadays. When you have a willing band of New Zeasinad manteurs ready to aselst with advice and organisation for a bonus such as this Convention it is difficult to see how anyone could pass up this golden opportunity for a most congenial and economical break from everyday chores.

micell briefs from your between as at least you can be compared to the original founders of NZART are expected to be present. Marion Lister writes that youth will also be catered for as well as VHF. Repeaters will be in operation, she says, so take the hand-held transolver with you for which a licence is necessary. Take photocopies of your licence and arrange for forms to be completed in advance.

forms to be completed in advance.

Accommodation etc. will be through Avis Ltd. and
It seems that Air New Zealand will also take
bookings and arrange group tours.

If you are interested in this once in a lifetime

If you are interested in this once in a lifetime scoop why not get further details by writing to Marion Lister, ZLIBKL, the organising secretary at P.O. Box 23-680, Papatoetoe East, Auckland, New Zealand.

All the above information kindly provided by David Rankin, 9V1RH, Region 3 Secretary.

Amateur Radio November, 1975 Page 21

Commercial Kinks

with Ron Fisher VK3OM 3 Fairview Ave., Glen Waverley, 3150

This month it's back to the FT200. It seems incredible that modifications keep coming in for this rig. I often wonder where it will

John Adcock VK3ACA has come up with improved CW performance for the FT200. "I would like to offer some simple methods of improving the usefulness of the

FT200 on CW. These modifications may be equally applicable to other transceivers. The FT200 falls short of my idea of a good CW rig in the following ways.

1. The final was designed for class AB1 operation and therefore is inefficient on CW. 2. There is no netting facility when using

a separate CW receiver, and 3. It is impossible to zero beat when transceiving. This is because the transmitted carrier is shifted inside the band pass of the filter on transmit but on receive

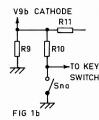
the beat frequency is not shifted, Consider the first point. In the CW position the final is operated under 'saturation' conditions and the input to the final is excessively high.

The plate current can be reduced by reducing the loading. Under this condition there is a tendency for the tuning capacitators to flash over. A common modification is to reduce the drive in which case the final will operate correctly in class AB1. This will reduce the plate current but the efficiency is very low.

The method suggested here is to increase the bias on the final. This will reduce the plate current and allow the final to operate in class C at the same time. This can be done by adjusting the bias resistor VR 103. However it is now necessary to readjust the bias resistor each time one returns to SSB. The best solution is a second bias adjustment. This is done by placing an extra resistor VRx in series with the bias line (see Fig. 1). Here a 50k variable carbon pot appears to be satisfactory. When the resistance of VRx is increased the voltage bias to the final will rise

Ideally this resistor should be switched in with the function switch in the CW position only. Unfortunately I have not dis-

covered a simple method of doing this. The pot VRx can be mounted at the right hand end (viewed from the back) of the row of pots. By carefully following the wiring it is necessary to run only a few



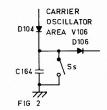
short lengths of wire to the printed circuit board.

To operate the new facility, when in the transmit CW position with the key down. rotate the new pot until the plate current is at a satisfactory value. 250 mA gives 150 watts input (do not hold the key down too long). When returning to the SSB position rotate the new control to the zero resistance position.

The second and third modifications are now considered. The switch Sn in Fig. 1a and 1b is a netting switch and the switch Ss in Fig. 2 is a shift beat frequency switch. These were mounted to the right (above and below) of the mike gain control at the right hand side of the panel. Time and space do not permit a detailed description of the physical wiring except to say that it is not difficult to place.

The switch Sn was an NKK Sb2061 DPDT press button type. Ss is an NKK SPDT toggle with only one pair of contacts used, The purpose of the net switch is to turn on the transmitter except for the final and thus provide a carrier for netting in an adjacent receiver. Sna will operate the relay system to turn the receiver off and turn the transmitter on. Snb maintains the maximum blocking bias on the final. There should now be ample carrier for netting a second receiver.

The switch Ss will cause the carrier crystal to shift in the receive position as well as the transmit, with the function switch in the CW position only. When tuning in CW, the clarifier can be left off or in the O



position and the incoming signal set to zero beat. Now the clarifier can be adjusted to the desired pitch. The switch Ss can now be left on or off as desired. The transmitted signal will now be zero beat with the received signal.

Some thoughts in the use of the switch are as follows. Using the switch is the only way you can be sure your transmitted signal is zero beat with the incoming signal. In the on position it does allow the CW to be copied at a lower pitch than is usually possible. This is sometimes an advantage under QRM conditions.

There is some feed-through from the beat oscillator to the AGC detector and this will cause a small shift to the "S" meter and some de-sensitising of the receiver. This may be undesirable on weak signal bands such as 21 and and 28 MHz. Also the switch should not be used when receiving SSB and transmitting CW.

Since all these modifications are independent of each other, any one or all can be tried".

BOOK REVIEW

GUIDE TO AMATEUR RADIO' by Pat Hawker G3VA It is my pleasure to review the 16th edition of Guide to Amateur Radio which has just been pub-lished by the Radio Society of Great Britain. The highly readable text is supplemented through-out by extensive use of diagrams, photographs and tables, making the book one of the most compact reference sources on this subject available. Naturally the book is intended for interested people in Great Britain but most of the text is applicable to Australia. The chapter titles are (1) This is Amateur Radio; (2) Getting Started; (3) inications Receivers; (4) Amateur

ters; (5) The Licence Examination; (6) Operating an Amateur Radio Station; (7) Workshop Practice; (8) Amateur Radio Equipment; (9) The RSGB and the Radio Amateur. The only sections not applicable here are Chap ters 5 and 9 and in the latter, WIA can be nearly written in, in place of RSGB. The Licence exam is significantly different here in Australia. Chapter is one of the best I have read on Workshop Practice. All in all I could not do less than reco

mend it to those who read, and those who should read, Newcomers Notebook.

Rodney Champness VK3UG

SPECIAL ACTIVITY STATION ZS4BD writes that the special call sign ZS4OIL will be activated to celebrate the 25th anniversary of South Africa's oil-from-coal plant at Sasolburg.



Sn = DPDT PRESS BUTTON CHANGE OVER SWITCH

Contests with Jim Payne, VK3AZT Foderal Contest Manager, Box 67, East Melbourne, Vic., 1975 REMEMBRANCE DAY CONTEST RESULTS . ь c d 218 843 781 26 1642 63338 VK4 128 44 29 89 89 16 1755 55421 842 855 1361 859 1265 VK7 238 126 2220 2122 18 11830 VK1 VK2 VK3 4 4 30519 23346 25838 VKS 526 a-Logs received d-Average top 6 logs b-Licences e-Total score c-Logs/Licences % f-Trophy score DIVISIONAL SECTION LEADERS' SCORES ARE SUBJECT TO FURTHER CHECKS In the following detailed scores the first figures are STATE SCORES VK1 Pho VP FT MF LF AH WI RH OJ 627 298 582 280 436 205 418 183 275 160 262 206 254 142 240 121 182 182 182 100 179 179 174 165 146 146 114 61 73 73 69 69 740 ZBL ML GB ZWP ANR CR PM JG/P4 ACA ZMV YR ZJJ ZT ZPH ZVT 1338 538 941 476 1208 528 ED 390 201 CW 52 8

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TH VM BHO JY KM ADR 110 100 110 81 51 25 ZC IV AXK WE BBB AND

213

484 133 AJQ 146

564 559 538 382 306 200 194 BET 182 29 30 41 10 17 10 9

YDT/ P4 119 119 Open UR UX RH AAT HE YG 1834 511 1763 528 1596 469 1373 439 AAR CCR PS DI

HZ 148 30

132

VK2 RG 1268 473

AJY

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Open BO DM AHM CAX 1571 469 1156 419 1082 396 958 296

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HT	975 534	ANP	230 123
AYF	924 521 868 492	ZD AIZ	213 106 190 78
CX	801 411	ZMP	184 185
OK	781 408	VQ	180 82
ADW	650 325	YIG	178 178
RV BKW	599 266	BCH	173 100
AQZ	598 426 566 330	EF AAJ	155 82 148 80
AMK	555 272	ZLW	138 138
LP	514 263	YBZ	136 136
ARY	512 248	YIE	136 136
YQ ALK	488 214	ASN	128 71 125 69
AXV	423 250 416 200	YF WM	125 69
SR	413 206	ZND	116 116
QG	364 170	ZBY	115 115
SM XF	331 151 316 160	RF BJM	110 38 108 108
AIE	308 174	WT	108 108 105 37
BEK	316 160 308 174 307 307 240 115	ARO	103 49
ABP	240 115	AIS	96 55
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AZP ZJS APV HE RN AJ KS AGU AVN AVO HZ

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Amateur Radio

1219 686 517 482 400 306 176 180 UA FJ BF 394 290 144

AXJ SO AAF PB PN OK 50 46 38 47 31 NJ CN SF AW 103 68 40 50 42 9 12 8

72 43

GL.	102 98	102 40	RH RH	58 58	22 58				VK7	J. Byrne M. Long L 60213 P. J. Hall	757 119 41 1010	247 119 20 430	listened quite a few times but nothing heard. Jack VKZCX reveals the real ham spirit in his comments, "I always enjoy any of the Australian contests, and I always take part in any contest just to repay my
Open	1233		Q.I		100	F.I	91	23	ZL	2-129	554	141	contribution to any country that takes part in any
ED MA	1233		GU	392		EJ KB	91 86						of our contests". Jack continued that particularly in the CW section of the RD the bands are dead
FI	1021	344	RU	315	89	HD	28	10	CHECK L	OGS 3ARK			between 2 and 8 a.m., and perhaps a break of 6
ZE	711	200 182	HK BL	297 250	108	CT	24	5	VK	XZ XZ			hours should be mandatory.
WA		151	TU	203	72					4RU 5HW 5JX			Probably the youngest contestant was Nigel Dobson of Fulham, S.A. who submitted an SWL log. Nigel is 12 years old. Another 15 year old,
CW										500			VK5KK D. Minchin, only had his call for 3 days prior to the RD. Dad had to share his gear while
WT	882	175	HQ ZO	590	122								junior scored 850 points! And finally a few words
AQ BS		150	OH	188						RANCE DAY CONTI			about Victor R. P. Cook, VK5AC, who has been licensed for 63 years. In 1912 he was XVN, and
									of logs	ne of writing this to stacked on the li-	ring room tal	erous pues de. North	as a foundation member of the WIA he must be
VK7									Melbourne	has just won the	Victorian Le	ague Foot-	among, if not the oldest, of the cat's whisker winders who sont in logs for this contest.
Phone									OTH to	tiership, I have of farra Glen, the fe	completed the	move to	It is now obvious that the RD rules need a
JV		359	ZMM	98		KS Al	50 40		house we	ere poured this mo	rning and co	insequently	thorough review. The scoring takes into considera-
MX		239	ZMC	88		KK	65	34	FCM's do	ould be some tim	e now to al	lot to the	tion the theoretical likelihood of making easy QSOs with the call areas with the most licensed ameteurs.
KH SF	438	178	ZGJ	87	86	ZAK	32	32		mments which acc			The results for many years past show that this does
GW		102	AW	88		ZER	25 22	22	logs reve	al the very wide of	opinions conc	erning the	not occur. VK6RS Ron has spelt it out, "I do. think the latest scoring table is very equitable, but
DW	368	110	AB	80	34	JD	13	10	essential	conditions for a ra-	dio contest. 8	Eric VK5LP	biased against us over here. We have always had
AK BM	187	100	BJ	68	42	ZDF	12		o very or	ed "A truly excelle intlemanly manner,	nt contest, co	is a nies.	to give away many more points than we could pos-
JU	168	95	CT	64	23	ZUF	۰		sure to	operate".			sibly score, but this time it is much worse. I worked all comers as I should, and made 368 points, or as
JA	161	44	ZWX	51	51				Stan V	K3AYF wrote that	the contest	gets better	it was CW exclusively, 738. To gain these points I
									every yea	er. VK3WW comm	ented, "Cong	ratulations	had to give away 703 or CW 1406. To give a VK2 five points to receive 2 means that for 37 stations
Open									ever for	participation and p	leasure". Ha	rry VK4KW	worked I received 74 points and gave 185 away".
BC	1393		RH		100	PF Al	331	105	earned a	good score and copy this log OK	apologised, '	Hope that	If you have ideas on the matter how about writing to the Editor of AR. Please do not write
CIC	043	110	22	400	100	AL	200	07	bed in t	copy this log UK lospital after an	as I am writi	ng this in	to the FCM as in the past some correspondents
cw										VK4KX wrote ar "Congrats on the		Interesting	have complained when their views have been pub-
BO	876	181	JB	205	50	zo	66	24	matters,	"Congrats on the	new rules, i.	e. Rule 5	lished in our magazine, and consequently sugges- tions received by the FCM cannot be made widely
HE	676	141	GV	190	27				(scoring),	b, c & d. Altho	ugh not muc	n help at	known. All that is wanted are a few simple rules!
CH	500	70	YL	82	19				apot cycl	e when the higher	frequency by	ands come	
VKI									good". I	However a VK6 cooking forward to a	ommented, "	l was, as	CONTEST CALENDAR
									but, on n	eading the rules d	ecided that th	e RD was	Nov. 8/9 European RTTY Contest
Phone									now ridio	ulous. Simplicity	must be the	word for	Nov. 9 Czechoslovakian
FB	1804	699	AS	1648	667	CEG	79	39	I am sure	est if you want po that the casual or	perator who n	nay decide	Nov. 8/9 ARRL CW Sweeptakes Nov. 22/23 ARRL Phone Sweepstakes
									to have a	bit of a go would	d have been	put off by	Nov. 29/30 CQ WW DX CW
Open 77	1033								can expe	dexities. If this i	s the sort or	submitted	Dec. 6/7 ARRL 160 metre Dec. 13/14 ARRL 10 metre
22	1033	203							my last R	D entry". A VK4, w	hose CW is it	mpeccable,	Dec. 10714 Anne 10 meter
cw									the effort	ed, "Your rules do s made by those v	not distinguis	h between	Czechosloyakian Contest
HA	456	78							the air, o	n 6 bands, both pl	one and CW,	and those	0000 GMT Nov. 9 to 2400 GMT Nov. 9th.
									who mer	ply listen in for to put in a score. Y	on minutes, s	o long as	Rules remain unchanged. Phone and CW. World wide contest with Czech stations having additional
P29									test which	h tries to be every	thing to ever	vbody and	value, Exchange RS(T) plus 2 figures indicating
Phone									which tur	ns out to be nothi	ng for anyone	Minimum	your ITU zone. One point per QSO, 3 points If with Czech station. Contacts with own country per-
WB	1502	392	MJ	1389	358	DM	801	210	interesting	a maximum numi activity. I suggi	per does not	make an RD contest	mitted for multiplier credit but have zero OSO
_									is not a	contest at all t	ut merely a	n activity.	point value. Multiply total by sum of ITU zones
Open		26							Should it	s name be chang t quantity partici	ed? You has	re set out	worked on each band for final score. Mailing dead- line Dec. 31st to Central Radio Club, Box 69, 113
EJ	97	26											27 Praha 1, Czochoslovakia.
ZL									Sam VK2	BVS sent a long an ch among many ot	d very though	-provoking	
									types of	calls. Call "CQ C	ontest" to In-	dicate that	CQ WW DX CW 0000 GMT Sat. Nov. 29 to 2400 GMT Sun., 30th Nov.
Phone 1BKX		200	24115	1241	222	SABC	270	102	you are v	vorking to maximis	e your score	and want	No changes to rules. Suggest see magazine for
1AQ0	375	136	2GJ	518	141	3BK		40	you want	rt contacts or "C prolonged contac	ts. Your com	ments will	details. Logs to reach CQ WW DX Contest, 14 Vanderventer Ave., Port Washington, L.1, N.Y.,
1AGO	313	84	38Z	843	231				be consi	dered, Sam.			USA, 11050 by Jan. 15, 1976. Essential you show
										who operates from			CW on envelope.
Open									he wrote	he views of many : "I wish to pro	test about t	he recent	
1ACL			3GG	700	158				changes	in the RD contest	as set out i	n the July	DX ITEMS
	,010			220	-					AR. I feel that the ating against the			VK2BVS reports there is a 160 m net on 1.825 MHz
CW									extent th	at the chances	of a country	operator	after the VKZ Sunday morning broadcasts and, also
4BE	976	131							winning a	particular section fic. or N.S.W. are	of the cont	est especi.	via VK2BPX, that ZL2IG and ZL2ABF transmit on 1.884 MHz and listen for VK stations on 1.825 MHz
RECE									approxima	stely even operato	rs. The intro	duction of	at 21.45h EAST. Also that YJBAM was worked on
V	K2	G. V	/. Paris	h		352	158		the VHF	contact rule was i	noving in thi	a direction	this band as well as VK3QI/VK8. CW is monitored
v	K3 K4	L 300	M2 339		1	644 023	157		operators	when you consider within the capit	al city areas	but the	continuously on 27.125 MHz to provide a link-up between operators on 10, 11 and 160 m nets. Several
		L 405	502		- 1	575	192		doubling	up of contacts o	n the LF bar	de is just	active stations on 28.5 MHz were also reported in-
		L 405	906			441	162		too muci	n-1			cluding HL9TG, VK6MB and a P29.
Page	e 24	Am	ateur	Radi	o N	lovemb	er, '	1975					

VK5 R. C. Whitford

10 7

L 50805 L 50122

N. Dobson

R. Warringto L 50096 VK6 M. Byrne M. Byrne J. Byrne M. Long L 60213 P. J. Hall 2-129

1276

Thanks for this most informative letter, Peter. Kerry VK5SU wrote that 20 m was best at his

Kerry VKSSU wrote that 20 m was best at his location, "Only one GSO on 15, that beling to P29, mi on 10 or above". VKSAIE (formerly VKRAZ) said he found the con-test as much fun in Melbourne as in Darwin, 10 metres did not seem to be open anywhere. He listened quite a few times but nothing heard, Jack VKZCX reveals the real ham spirit in his comments,

ST MF MB AV ZIW BY ZHJ PL GL

95 88 88 70 65 63 58 CN DZ XX CD WD MM GV 40 40 37 30 18 7

PS HU QR SH ZDA ZLR ZJD KC RH 89 88 88 70 65 63 22

VHF UHF an expanding world

with Eric Jamieson VK5LP Forreston, S.A., 5233

VKOMA, Mawson VKOGR, Casey VK1RTA, Cenberra VK3RTA, Vermont VK4RTT, Mt. Mowbullan* VK5VF, Mt. Lotty VK5VF, Mt. Lotty VK6RTV, Perth VK6RTV, Kelgoorlie VK6RTW, Albany VK6RTW, Albany	53.16 53.21 144.71 52.61 144.44 53.01 144.81 52.31 52.31 52.91 144.51
VK1RTÅ, Canberra VKARTÅ, Vermont VKARTT, Townsville VKARTT, Mt. Mowbullan* VKSVF, Mt. Lotty VKSVF, Mt. Lotty VKSRTV, Perth VKSRTV, Kalgoorile VKSRTV, Albany VKSRTW, Albany	144.47 144.71 52.61 144.41 53.01 144.81 52.31 52.31 144.51
VK3RTG, Vermont VK4RTL, Townsville VK4RTT, Mt. Mowbullan* VKSVF, Mt. Lofty VKSVF, Mt. Lofty VKSVF, Wt. Lofty VKSRTU, Kalgoorile VKSRTU, Kalgoorile VKSRTW, Albany VKSRTW, Albany	144.7/ 52.6/ 144.4/ 53.0/ 144.8/ 52.3/ 52.3/ 52.9/ 144.5/
VKARTL, Townsville VKARTT, Mt. Mowbullan* VKSVF, Mt. Lotty VKSRTV, Perth VKSRTU, Kalgoorlie VKSRTW, Albany VKSRTW, Albany	52.6 144.4 53.0 144.8 52.3 52.3 52.9 144.5
VK4RTT, Mt. Mowbullan* VKSVF, Mt. Lofty VKSVF, Mt. Lofty VK6RTV, Perih VK6RTV, Kalgoorlie VK6RTW, Albany VK6RTW, Albany	144,41 53,01 144,81 52,31 52,31 52,91 144,51
VKSVF, Mt. Lofty VKSVF, Mt. Lofty VKSRTV, Perih VKSRTU, Kalgoorlie VKSRTW, Albany VKSRTW, Albany	53.01 144.81 52.31 52.31 52.91 144.51
VK5VF, Mt. Lofty VK6RTV, Perih VK6RTU, Kalgoorlie VK6RTW, Albany VK6RTW, Albany	144.81 52.31 52.31 52.91 144.51
VKSRTV, Perih VKSRTU, Kalgoorlie VKSRTW, Albany VKSRTW, Albany	52.31 52.31 52.91 144.51
VKSRTU, Kelgoorlie VKSRTW, Albany VKSRTW, Albany	52.31 52.91 144.50
VK6RTW, Albany VK6RTW, Albany	52.91 144.51
VK6RTW, Albany	144.50
VK6RTV, Perth	145.00
VK7RTX, Devonport	144.9
3D3AA, Suva, Fiji	52.50
ZL1VHF, Auckland	145.10
ZL1VHW, Walkato	145.1
ZL2VHP, Mt. Stewarte	52.50
ZL2VHF, Wellington	145.2
ZL2VHP, Palmerston North	145.2
ZL2VHP. Palmerston North®	431.8
ZL3VHF, Christchurch	145.3
ZLAVHF, Dunedin	145.4
	ZL2VHP, Mt. Stewart* ZL2VHF, Wellington ZL2VHP, Palmerston North ZL2VHP, Palmerston North* ZL3VHF, Christchurch

For a start the Mt. Mowbullan beacon is operational in with its new call sign VK4RTT using 20 watts of FM in a letter from Selwyn ZL2BJO comes news of

the first ZL beacon on 6 metres, ZLZVHP, and I note they have had the very good sense to put it where we might hear it, namely on 52.500 MHz. The beacon runs 10 watts output with horizontal polarisa-tion, keying 800 Hz -ve FSK. The antenna consists of crossed dipoles at 35 feet on Mt. Stewart, which must be somewhere near Palmerston North. Reports are requested from anyone hearing any of the ZL2VHP beacons, of which there are three listed herein, details to Selwyn Cathcort, ZL2BJO, 406 Featherston Street, Palmerston North, New Zealand. Their 70cm beacon has also been given a listing.

Other points of interest in Selwyn's letter concern VHF Field Days as follows: Sunday, 16/11/75: 2200 to 0200 GMT, 6 metres only. Saturday 6/12/75 0400 1000 GMT all bands: Sunday 7/12/75 1800 to 2400 GMT all bands

QUEENSLAND NEWS Very pleased to receive some news this month on activity in VK4, firstly from Noel Lynch VK4ZNI who

is Secretary of the Brisbane VHF Group, who sent notes prepared by their President, Dave Laurie VK4DT, which are as follows: General: The Brisbane VHF Group has about 50 active members and holds general meetings on the fourth Thursday of each month. All visitors welcome

to the Club Rooms in the Oakleigh Scout Grounds off High Street, Dorrington. The Club has active 70 cm and Repeater Committees and runs a very successful fund raising venture. 52 MHz Band: There are about 25 stations active mostly using low to medium power SSB. Activity is mostly limited to Sunday mornings when many stations are on 52.050 and 52:100 MHz. Many stations will be active again this Christmas, particu larly when you can hear their "beacon" TV station TVQ0. Many stations also monitor 52,525 MHz FM

144 MHz Band: About 40 stations are active on the lower end of this band using a mixture of SSB and AM. (VK5 stations might note this amount of activity and take heed . . . SLP). The main calling frequency is 144.100 MHz and a call there during the evening will result in a QSO. Several station: are capable of working through Oscar 6, several

as a guide to band conditions.

more building equipment. more building equipment.
On the "push-button" frequencies, Channel 40
and 50 are the most popular with activity by about
100 stations spread evenly between them. Two
repeaters (Ch. 1 Mt. Tamborine and Ch. 3 Ipswich) are currently in operation, and two oth

Toowcomba and Ch. 4 Mt. Glorious) have licence applications pending. 432 MHz Band: About 12 stations operate using SSB, FM and AM. The Brisbane VHF Group is holding a series of lectures aimed at increasing interest and activity on this band. Another 20 members are commencing construction of a 70 cm converter as a Group project.

The Group's 70 cm Committee is also en

in the construction of an unattended 70 cm beacon transmitter. The project is about 60% complete, and a licence is soon to be applied for, and the aim of the beacon is principally to aid members to tune up their converters. A lot of interest is being expressed in 70 cm repeaters in S.E. Queensland, and the Group will be active in the bandplanning Conclusion: The Group is encouraging increased

activity on these three bands and in the future will be setting its sights on higher bands.

Thanks chaps for your notes of interest. Will be pleased to hear from you again.

Whilst still in Queensland, John VK4UI seni

news of some of the work of the Gold Coast Radio Club at Southport. He reports the new mast for the Club at Southport. He reports the new mast for the repeater on Mr. Tamborine has been erected, but not yet completed. The new high gain aerial systems have still to be attached, and secured against storm damage. When the VHF repeater is completed, work will commence on a U.H.F. Re-peater Project for 432 MHz using the same site and mast. They have been fortunate through the good services of John Willis VK4WN of Willis Com cations, Brisbane, in securing a complete trans-mitter/receiver for the U.H.F. Reneater. Good luck REPEATER USER GROUP

While we still seem to be on repeaters, I note with interest the setting up of such a group in VK6 (from the VK6 VHF Group Newsletter) for the maintenance, and financial operation of the repeaters, so anyone who uses repeaters under the control of the Group are considered members, for which a fee of \$4.00 p.a. is expected. This seems fair enough, and I note a similar line of thinking is being undertaken in VK5 from notes in the VK5

In VK5 there has already been some help with finance from members, plus some who are not members of W.I.A. — for best reasons known only to them — so it only seems logical where considerable running costs are involved that these costs should be shared by all users, not those who contribute as W.I.A. members. Unfortunately this comment won't be read by those mostly to whom it is directed, the non-members, so members should take up the issue with those who subscribe nothing. Talking of running costs, I see an interesting comment in a letter published in "QRM" from

Northern Tasmania, that over in Botswana in Africa where Chris VK7UX happens to be, the power charge is 15c per Kw, with the exchange rate being the same as the \$A. It may pay you to take your own alternator if going there. E.M.E. REPORT

Still no one writes except the Dapto N.S.W. Group, so I can only presume all others scheduling EME are atisfied to the limit or don't have the time to write, which is a pity. However, Dapto reports: "EME tests scheduled for 9/8/75 with K2UYH. WISL and VE7BBG, but they could not get on. However, W3CCX called us and was worked for our

first contact with them. The second test period for 9/8 was a European CQ period. Called by F9FT and had our first contact with him. PAOSSB also called us but we missed out on a contact due to the moon getting too low. He had a good signal. We were also heard by G3LTF. "F5SE (2nd op. of F9FT) has since advised t

point to point distance between us is 16821 Km which is just 100 Km short of our record with G3LTF. He also provided details of several interesting extra galactic radio sources, some of which are in our window. As they emit a constant signal they can be a useful reference for calibration purposes. F5SE has derived a formula for their use and has asked us to check it on certain sources accessible only in the southern hemisphere. F9FT has a big signal which peaked to 10dB over noise for a short period.

"We have now had 432 MHz contacts with six different stations in four countries (but no VK con tacts yet!!). With our higher power output we hope eral more contacts over the next few mo

seem a lot!

as 6 contacts in 5 years effort probably does not WE ACTIVITY As you guessed, there is not a lot to report, but

it is noted that Keith VK5SV has been hearing the Mt. William repeater on Ch. 1 occasionally; not strong on 10/9 023OZ. Tues. 23/9 Keith worked VK5ZWP at Cleve on the West Coast via the Ch. 1 repeater. Also heard VK3VL and VK2YAH who was at Swan Hill . . . Meteor scatter contacts are being made again. Old Wally VK2ZNW (ex-5ZWW) made it to Peter VK5ZPW with good signals on 23/9. Peter is now using a pair of 61468's and has a potent signal. Good work chaps. A few changes are likely to be made at this QTH (5LP) which then might allow me to send a M/s signal over to Wally, even the Baron of Oyster Bay, Rod VK2BQJ might VKS CONTEST

A reminder of the VK5 VHF Group Contest over the sekend of 6th and 7th December. The 6 metre band will be open to the Eastern States during that period so some good contacts should ensue Appears a number of stations and groups are likely to be going out on to their favourite mountains, and it will be as well to remember the ZL's are also going out onto their favourite mountains the same Two metres will be available again this year in

December so get the gear ready, contacts are being sought in Brisbane and Sydney from VK5. And there does not seem to be any reason why good conditions should not prevail to VK6 on 2 metres in the New Year period. You see!

In the June 1975 issue of these notes, I outlined what SMIRK was (Six Metre International Radio Klub) with No. 1 SMIRK being Ray Clark, of San Antonio, Texas, U.S.A. Through the medium of Peter, VK6ZDY, comes some further information from Ray, and the following has been selected as likely to interest those who read these columns. The information has been edited where necessary to make concise reading. The main information comes as of 29/8/75

which would be towards the end of the Northern Hemisphere Es season, and some very good contacts had been made considering we are do the bottom of the 11 year cycle. K7TUO and K7GWE worked KH6EQI in Hawaii, and Ray remarks that worked KH6ECI in Hawaii, and Nay remarks that is the first honest-to-goodness contact to KH6 he knows of in the past few years. The rest have been third and fourth hand reports. VE1, VE2 and VE3 in Canada were worked, also C6A, TGSKJ, KP4, XE1, XE2, T12NA and VYSRA have been heard or

VE1ATN on 50.056 is a beacon station, while FOSDR is still active on 6 metres in Tahiti, KZ5WA should be on 50.110, also HPIXDC. On Swan Island HR6SWA should be using SSB on 50.110. and HC8GL also on. Guam has more than one beacon, listen for KG6JDX on 50.105 and KG6APP on 50,150, K2IRT/KG6 runs a beacon on 50,098 and listens on 52.150 or 52.050. (That last bit is steresting to us . . . 5LP).
Across the Pacific in Japan, Ray advises quite a

lot of 6 metre activity, though six metre stations have had their power cut back from 50 to 20 watts since June due to the QRM caused by the mass of JA stations in operation. Stations to listen for are: JD1YAA beacon on 50.110. K2IRT/KG6, KG6APP, HL9WI, HM1GO, HM1FM (on JA0QKM/JD1, HM1EJ, KG6JCM, VS6AI, VS6BE, JE3DGJ/JD1, KG6JFT, KG6JFR and VK4IK/KG8, Bill KX6HK is now in U.S.A. on 6 metres in New England, having left the Marshall Islands. A new station on is HL9VP. That about covers the best of the information, but

It is very interesting. Those of you sufficiently interested will be able to get out your prefix lists and maps and pin-point where some of these stations are located. With so many people now owning FT620's with their capability of tuning effectively down to 50 MHz, it would be a good idea for the keen DX-er to purchase the extra crystals to give the full coverage from 50 to 54 MHz. I have the full range in my FT620 and with the facility of being able to quickly peak the front end of the receiving section, adequate sensitivity is available over the full range. Bear in mind also our antennas will still have some useable gain down to 50 MHz despite being cut for 52 MHz due to the slow taper off in performance of a yagi as the frequency is lowered away from the resonant point.

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FINGERTIP	MATH (Edward M. Roberts)	\$2.95
	LETE SHORT WAVE LISTENERS' HANDBOOK	
(Hank	Bennett)	\$8.05
TRANSISTO	R EQUIVALENTS (De Muiderkring)	\$5.95
RCA SOLID	STATE — 1975 DATABOOK SERIES —	
SSD-201C	Linear Integrated Circuits Selection Guide/Data	\$4.50
SSD-202C	Linear Integrated Circuits Application Notes	\$4.50
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McGILL'S AUTHORISED NEWSAGENCY

187-193 ELIZABETH STREET, MELBOURNE, VIC., 3000 Established 1860

"The G.P.O. is opposite" Page 26 Amateur Radio November, 1975 reverse is true for the W stations whose as will lose efficiency faster on coming up to 52 MHz. but then they run more power as a rule. With the slow rise out of the low part of the cycle from now onwards, and with so much better equipment now in use, every possibility exists for And we must remember the Americans are now more interested in working us, and are aware of our 2 MHz difference in frequency, which did not seen to be the case in general during the last sun-spot

a full call, then be set up to use CW on 52 MHz when that elusive or exclusive DX comes through: get set up now. Peter VK6ZDY adds a little information himself. He mentions the Perth beacons at Bickley have their antennas mounted at the 130 foot level on the Channel 7 TV mast, the 6 metre beacon running with 23 watts out and the 2 metre 10 watts out.

Peter advises no TEP heard or worked from Perth for 1975 so far, so conditions are really at a low ebb. He will be set up before Christmas for high power 2 metre operation, so maybe the Perth barrier can be broken this year, and take the prizes

Also do not overlook the fact that if you have

away from the Albany area My thanks go to George VK3HV for the receipt of a very well set out Repeater Directory covering all States 146 and 435 MHz Information will be drawn from this as required.

Can I get up on my large soap box again with a plea to users of the FM section of the 2 metre band to help us to retain the lower section of 2 metres by becoming operational there as well. I have no objections whatever to FM and/or reneater operation by anyone, but I am afraid for the safety of 144 MHz, especially here in VKS where the operation is almost nil, but hundreds of stations operate on 3 or 4 FM channels. Or don't you care? "Let us Closing with the thought for the month not look back in anger, nor forward in fear, but around in awareness

The Voice in the Hills.

LADIES AMATEUR RADIO ASSOCIATION NEWS

LARA has been growing steadily over the last few weeks. As well as this, LARA has started to weeks. As well as this, LARA has started to develop various projects which members have auggested. Some of these are for the benefit of amateur radio in general and not just the YLs. Other projects are designed to help YLs just start-ing off in amateur radio since it is difficult to start from scratch, as many of us are doing.

Events such as YL/OM foxhunts are designed to be family events with everyone participating (as well as being good funi) The spectacle of YLs standing around bored, or staying at home on field days, might just disappear if these events can

continue.

Weekly skeds on 80m are now uniting YLs all over Australia, with occasional visitors also appearing on the nets. We all know how lonely it can feel to be a YL in what is, somewhat overwhelmingly, an OM field. Our first skeds were quite funny with a few 'rookle' operators being 'mike shy' but getting together with other YLs for a chat is a very rewarding experience. We all have to start somewhere and the YL skeds are a friendly atmosphere for getting your feet wet. Yts who don atmosphere for gettling your feet wet. YLs who don't yet have licences also Join in these skeds as guests on OM's calls (with supervision). This allows us some access to the bands and is a great incentive for gettling one's own call. More YLs are being seen at WIA and club classes and we will have some brand new YL calls after the 'next exams'

Possibly as YL amateurs become more numerous the PMG will desist from addressing their com-munications to 'Dear Sir'!

One LARA project which has been getting off the ground in VK3 is the crystal bank. This is a scheme whereby donated crystals are loaned to amateurs, over a certain period, for a small fee. This should cover running costs and will allow purchase of additional crystals when demand exceeds supply. Some crystals will be offered for sale or exchange from time to time to allow updating of the available range. We will be keeping as large a range of amateur band crystals as possible with any amateur eligible to borrow. When Novice calls are introduced we will be able to help these operators to get on the air with crystal controlled rigs. The establishment of crystal banks in other States would be a move to be considered by clubs and groups as this is a realisation of the amateur spirit of helping the beginner.

For the future, LARA is planning to start a YL award with conditions similar to those of other awards, the difference being that both licensed and unlicensed YLs will be able to enter. On an international level LARA has contacted the ZL YL organisation, WARO, and helpful suggestions from this established group were much appreciated in getting LARA on its feet. ZL operators have events and skeds will be organised between the

LARA in VKS is planning some local events such as foxhunts and YL events at club and Zone field days. The social side will be organised with meetings to bring the group together and other events in store

LARA in VK3 can be contacted via the WIA LAHA in VKS can be contacted via the Wi-Victorian Division or you can join in the weekly skeds held on Monday nights at 8.00 pm EAST on 3850 kHz (and on Tuesday nights a 2 mF M story for Melbourne YLs starting on Channel 1).

MAGAZINE INDEX

with Svd Clark, VK3ASC

BREAK-IN August 1975 A 6 Metre Transverter for the FT101; A Battery Saver for the Wellington Walkie; Making Printed Circuit Boards; Converting the Pye Commando to 80 & 40 Metre Operation; T.R.I.C.O.; Sock It to Me: A High Performance VHF Converter.

RADIO COMMUNICATION July Bulletin Reflections; Switched Polarization Cubical Quad: A Simple pre-scaler for 145 MHz: Technical Topics deals New Graphic Symbols; Wavechange switching with Diodes: Variable Power More on Cathode Impedance & Class C; PAOKSB Phased Locked VFO; VFO Stabilized by PAL Delay Line; Single Sideband CW; Building Blocks the Novice.

September
Subjective Selectivity and Stereocode; 2m SSB
Transmitter using the FR400SDX VFO; GB310W a
'n GHz Bracon; TT: Home Offlice TVI Statistics;
Amelifiers; Delay Line Ca-Class E High Enciency Amplines, Joseph Line Sup-cilitators; The GSULR PALO; Elastic Aerial Sup-ports; Audible Output from Digital Instruments; Third Method SSB — A Warning; Long Delay Echoes Unheard; A Toleprinter Message Generator; Cumulative Index 1970-4.

MOBILE NEWS July What shall we do with the Profit: Subscription enewals; Maurice Margolis Award; TRIO TR2200 Transceiver Reviewed.

RADIO ZS June Lightning Research; First Steps (50 years after-wards); Go and Take that Test.

READERS NOTE: Magazines Indexed herein are Federal Office property and requests for copies of articles should be addressed to P.O. Box 150, Toorak, 3142, accompanied by a SASE and suitable

PROJECT AUSTRALIS

WISH DAVID MISS VK17DM

Due to an unfortunate delivery problem the notes for October AR never made it. Our apologies to all those who rely on the orbit predictions. OCCAD & DIDTUDAY

The 15th of October marked the third birthday for the first of the two present operational satell Oscar 6. The fact that the satellite was designed for a life of 12 months speaks well for the care devoted to its design and construction. Something should be said also for the persistence of the ground command stations since this satellite requires orbit

by orbit attention. PHASE III FREQUENCIES CHOSEN

Advice has been received from Dr. Karl Meinzer of AMSAT-DL regarding the final choice of the uplink - downlink bands for Oscar 8. It may be remembered that during the March satellite conference in Washington the author put forward the view that VK would prefer 2 metre uplink and 70 cm downlink as being the reverse of Oscar 7. This was very much a personal appreciation of what was suitable for VK, there being no time to refer this back to the WIA. Subsequent correspondence to me on this

question backed my stand I am glad to say. It has now been decided to fly a primary re-peater using these frequencies (2 m up to 70 cm down) and if time permits a second repeater of reverse frequencies will also be flown, to be time shared as usage dictates. Australis' regards these decisions as being most suitable for the next satellite and is happy that the question has been re-solved to the benefit of all concerned.

Time Long

NOVEMBER PREDICTIONS OSCAR 7 OSCAR 6 ("On" Days Only) Orbit Time Orbit Time Long Date No. Mode Z

ate	No.	Z	·W					
1	13917	01.29		1	4389		00.34	58
2	13927	00.28		2	4414	В	01.28	72
3	13942	01.23		3	4414	Α	00.28	56
6	13979	00.18		4	4427		01.22	70
8	14004	00.13		5	4439	Α	00.21	55
9	14017	01.08		6	4452	В	01.16	68
0	14029	80.00	53	7	4464	Α	00.15	53
3	14067	00.58		8	4477	В	01.09	67
5	14092	00.53		9	4489		00.08	52
6	14105	01.47	78	10	4502	В	01.03	65
7	14117	00.47		11	4514	A	00.02	50
0	14155	01.37	75	12	4527		00.58	64
2	14180	01.32		13	4540		01.50	77
13	14192	00.32		14	4552		00.50	62
14	14205	01.27	73	15	4565	Α	01.44	76
7	14242	00.22		16	4577		00.44	60
9	14267	00.17	55	17	4590	Α	01.38	74
10	14280	01,11	69	18	4602	В	00.37	59
				19	4615	Α	01.32	72
				20	4627		00.31	57
				21	4640	A	01.25	71
				22	4652	В	00.24	55
				23	4665	Α	01.19	69
				24	4677	В	00.18	54
				25	4690	A	01.12	67
				26	4702	В	00.12	52

4715 Ā 01.06 66

4727

4740 00.50

> 01 41 76

28 R 00.05 51

DECEMBER PREDICTIO 14292 00.11 54 14330 01.01 66

7	14368	01.51	78	4	4803	В	01.41	75
8	14380	00.51	63	5	4815	Α	00.41	60
1	14418	01.41	76	6	4828	В	01.35	73
3	14443	01.36	75	7	4840	Α	00.34	58
4	14455	00.36	60	8	4853	В	01.29	72
5	14468	01.30	73	9	4865	Α	00.28	56
8	14505	00.25	57	10	4878	В	01.22	70
D	14530	00.20	56	11	4890	Ā	00.22	55
1	14543	01.15	70	12	4903	В	01.16	68
2	14555	00.15	54	13	4915	A	00.15	53
5	14593	01.05	67	14	4928	В	01.09	67
7	14618	01.00	66	15	4940	A	00.09	51
В	14630	00.00	51	16	4953	В	01.03	65
9	14643	00.55	65	17	4965	A	00.02	50
				18	4978	В	00.57	64
				19	4991	A	01.51	77
				20	5003	В	00.50	62
				21	5016	Α	01.45	76
				22	5028	В	00.44	60
				23	5041	A	01.38	74
				24	5053	В	00.38	59
				25	5066	Ā	01.32	72

28 29 Please Note: Oscar 7 should stay on mode A through Jan. 1 in order to resume odd day mode A even day mode B during 1976.

5091 A 5103 B

5128 B 00.18

5141 A 01.13

5116 Ā 01 19 69

71 01.25

56

54

00.25

LIONS INTERNATIONAL

VK4CW has sent a photocopy of a letter from Lions International advising he obtained first place inter-nationally in the 1975 Hunting Lions in the Air Contest whilst VK5ZX secured 4th position. This contest he says is held annually over the 2nd week-

YRCS

with Bob Guthberlet 31 Bandon Terrace, Marino, S.A., 5049.

The story is told of a preacher who was asked to conduct a service in a small church set amidst the scrub in the Adelaide hills. Arriving several minutes before the appointed hour he decided to make an inspection of the property. The outside appearance suggested a poverty stricken congrega-tion, but inside the furnishings indicated that the people valued their place of worship. In the porch he noticed a small table covered with a green balze cloth and on it a small wooden box with the word "Donations" printed on the lid. As a friendly desture he opened the box and placed a two shilling piece therein. With the arrival of the congregation the service commenced and at the conclusion, an elderly steward approached the preacher, and after ecoury steward approached the preacher, and after thanking him, requested that he accept a donation to help defray travelling expenses, pointing out that they kept a small box in the porch for such purpose. Somewhat non-plussed the visitor kept silent. In the porch the box was duly opened; "Sorry, Sir", said the steward. "there's only two shillings here. but it may help a little"

Arriving back home the preacher told his family of the incident and how he received the money he had put into the box, whereupon his young son "Dad, don't you think if you had put more in you would have got more out?

Far be it for me to moralise on this story - I leave it to your imagination, but if your club, or as a State Supervisor your YRCS affairs are not ticking as they should, perhaps you should ask yourself the pertinent question: "Don't you think if you had put

more in etc. etc". Received a letter from VK6 a few days ago informing me that Norm Hyde has resigned from the position of State Supervisor. Thanks, Norm, for your help to YRCS. Now for a few excerpts from that letter which does not auger well for the future of the Scheme in the West. Quote, "The Hamilton Hill S.H.S. Club had the Science Master changed so the ham in charge of YRC was denied access to the Club transceiver which is part of the Science room facilities". Unquote. Here's the next one: "Another S.H.S. Club has a FT101B but it is not allowed to put up any serial. It has to be put up by the Public Works Department who are not interested". Unquote. The final quote: "Each High

School is under the jurisdiction of its Head Master and each one has different ideas". Unquote. One can only hope that those responsible for this Gilbertian situation know what they are doing to youth. On many previous occasions I have appe to State WIA Divisions to get right behind YRCS but with limited response. Why is it that State WIA Councils will not foster the very means whereby they could increase local membership. May I sug-gest to all State WIA Presidents that they include, at least once a quarter the following question on their agenda: "What more can we do to promote the cause of YRCS in this State?"

And, I would like a few angry replies from those who are really interested in the welfare of young persons. Maybe, too many amateurs are filling the other with nonsensical jabble as they twiddle the knobs on the little black boxes, and showing little or no concern for the generation which hasn't any

couragement to follow them, but probably will despite the lack of support. _____

Awards Column with BRIAN AUSTIN VK5CA P.O. Box 7A, Crafers, SA, 5152

WORKED ALL SM 2 (WASM 2) AWARD The award is available to licensed amateurs. Contacts after 1-1-1953 are valid. QSL cards must be submitted with the application along with a check list showing full details of the contacts. The award is available for all CW, all phone and mixed modes. The fee for the award is 7 IRCs. The address to:

applications is: K. O. Friden, P1. 325 Ollovstrand. 260 90 Bastad,

Page 28 Amateur Radio November, 1975

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Stations require confirmed contacts the 25 laens (countries):

A Stockholm-Stad B Stockholm Ian Uppsala Sodermanland Ostergottland Jonkoping Kronberg SM7 SM1 SM7 H Kalmar I Gotland K Blekinge Kristianstad SM7 SM6 SM6 SM6 SM6 SM4 SM4 SM4 SM5 Goteborg och Bohus Alvsborg R Skaraborg Vermlend Orebro Kopparberg Gavleborg Vasternorrland SM3 SM3 SM2 .lamtland

Vasterbotten BD Norrbotten 1976 SUMMER OLYMPICS AWARD A certificate to honor the 1976 Summer Olymp will be awarded to licensed amateurs who comply

with the following requirements Amateurs must work 5 Montreal Island station Contacts must be made between 1-8-1975 and 31-7-1976, any mode.

Send \$1 or 5 IRCs and a copy of your log con-taining date, time, station worked and operator, mode, frequency, received signal report, sent signal report. No QSLs required. Send applications to:

Secretary, Westminster Amateur Radio School, Box 323. intreal Int'l Airport, A.M.F.

P.O. Canada

WORKED ALL ZS

The award is available to licensed amateurs.

Contacts on and after 1-1-1958 are valid. Claims which must be sent by registered post, must be accompanied by proof in the form of QSL cards or letters and sent to the sponsor. Endorsements are given for all CW or all phone

if the QSL cards etc. clearly indicate the mode used. The fee for the award is 50 cents (South African currency). The award is, however, issued free to members of SARL. The address for applications is:

Awards Manage South African Radio League, Postbox 3911, Cape Town,

Rep. of South Africa. Requirements: 100 QSL cards or other proof ar required as follows:

78 789 10 Z83 Z84 Z85

WA	NTED	

-	-	-	-	-	-	-	-	-	-	-	-
		A	RT	ıc	LE	s	FC	R	AF	3	

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IONOSPHERIC **PREDICTIONS**

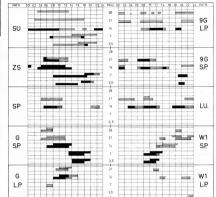
WITH LEN POYNTER VK37GP All times are UTC, Predictions courtesy of lone spheric Prediction Service, Sydney. Sunspot In-formation: Dr. Waldmeier, Swiss Federal Observatory, Zurich. Geomagnetic Planetary Indices-Institut fur Geophysik, Gottingen, Germany. K in-dices Local: Toolangi Geomagnetic Observatory,

I trust that last month's effort will not have been in vain; somehow I was out in proportion and caused much confusion. This month I have and caused much confusion. This month I have tried a form of bar chart. Each block indicates paths eastwards and westwards. The top portion is based on Perth, the lower portion based on Can-

berra To read: The black portions are based on pre-dictions for time of year, etc., when the path would normally be open. The striped portions indicate openings that could occur with abnormally

good conditions In retrospect, July, August, September has shown a slight upward trend in sunspot activity with a distinct peak during the first week in August, and is now settling down again to normal in the latter part of September. Solar activity in the terms of Solar Flux has lifted since the April, May, June low, Geomagnetic disturbances have noticeably less activity, averaging two per month but only of moderate activity and lasting three or four days.
If you are following WWV K index at +14 mins, If you are following WWV K index at +14 mins, it has been noted that a period of good conditions exists just prior to a rise in the K index. So the qualification 'tending to rise' will indicate a period unsettled conditions to follow. During August and September some good openings occurred on 1.8 and 3.5 MHz, 7 MHz has improved, whilst 14 MHz has produced some fine openings across all

paths within the predicted times. 21 MHz has shown some promise, but not quite across to Africa yet 28 MHz has been very patchy with just a few



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CRYSTAL CLOCK AND DECADE COUNTER UNIT This unit comprises a 10 MHz crystal oscillator and eight decade counter units with TTL outputs at each decade and additional functions of divide by 2 or by 4. The crystal oscillator can be used also with any frequency crystal between 1 and 20 MHz to provide decade outputs of ese frequenc ALSO AVAILABLE IN C-MOS

The W0250 WIDE BAND AMPLIFIER can be used to improve the sensitivity of most frequency counters. The operation of this unit is simplicity counters. The operation of this unit is simplicity to the sensitivity of the sensiti 100 kHz to above 500 MHz, Gain 40 dB,

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WILLIAM WILLIS & CO. PTY. LTD. orbury Rd., Canterbury, Vic. 3216 North-South openings of short duration observed. Smoothed Sunspot Number (R6) for February 75 was 22.2. The August mean was relatively high 75 was 22.2. The August mean was relatively high at 39.3 (July 28.3, June 11.4). The predictions for amoothed numbers to February 75 have risen slightly, no doubt as a result of the July, August highs. They now run (July 75) Sept 15, Oct 13, Nov 12, Dec 10, Jan 9, Feb 8. Looking back to Frank Hines VK2QL summaries

of monthly means sometime back, a low of 3.4 In April 54 and 9.7 in Oct 64, then looking at June 75 at 11.4, we could almost be bold enough to say we are at the bottom six months. March/April 76 still looks a reasonable target for the

looks a feasonable leager to the grant of th copy. QTH is okay in any call book since 61,

Afterthoughts

ADDITIONS TO RULES FOR VK5 FIELD DAY Additional rule No. 1:

Contacts via Oscar Satellite may contact each station every pass. Additional rule No. 2:

Cross bands points multiply by points of highest band used. Additional rule No. 3: Mark logs stations either multi-operator or

single operation for purpose of scoring. Hamads

- Eight lines free to all WIA members.
 \$9 per 3 cm for non-members.
- Copy in typescript please or in block letters to P.O. Box 150, Toorak, Vic. 3142.
- Commercial advertising is excluded. Closing date: 1st day of the month preceding publication. Cancellations received after about 12th of the month cannot be processed.
- . QTHR means the advertiser's name and addre are correct in the current WIA Radio Amateurs Call Book.
- . The current WIA Calibook is the 1975 edition.

FOR SALE Mobile HF Ant. Mounting Base, CW heavy duty spring and integral 50 ohm 1/2" coax (approx. 10 ft.). - still in carton (Belling Lee), \$20 or offer.

Phone Ron VK3CN (056) 55 1929, 26 Radovick St., Korumburra 2050 Collins 7551 Receiver, fitted with Waters rejection tuning, mint condition, \$350. VK4VK 6 Tosti St., Sorrento, 4217, Ph. (075) 38 4164.

Drake Complete Station, R4B Rx, T4XB Tx, MS4 speaker, all as new, \$695. VK3OM, QTHR. Ph. (03) 560 9215

Frontier 1200GT Transceiver, \$150. SR550 Star Rx (amateur bands only), \$95. VHF Pye Overland (not converted) \$20 VK2ALK Ph. (02) 528 7967.

6M-SSB-Heath SB110A SSB/CW transceiver HP23 AC PSU and port, beam, 180W PEP Tx --0.1 uV Rx sens., \$330, Heath HP 13A 12V DC/DC PSU, \$35. 2M Poly-Comm 144-148 AM/CW tuneable transceiver with inbuilt Rx VFO and Tx VFO or ext. xtal, squelch, noise blanker, AC/DC PSU inbuilt. Copies FM FB excellent for mobile or base, \$135. All units in mint cond. with manuals and cables. VK3BGW, L. Kubis, QTHR. Ph. (03) 232 8528 A.H.

or (03) 699 2011 bus Pye Base Station PTCA703, 3/20 final 53.032 MHz and PTCA116 Mk III mobile unit. Both in going coldition. \$34 ONO. VK3YFB, QTHR. Ph. (03) 758 173

Comm. Rx TCA R5223. 14 tubes, 29 bands, xtal locked dual conversion, hi stability, new, never in service. Sell BO or trade VHF gear. A. L. MacFar-lane, Lardner Rd., Warragul, 3820. Carphone STC 131, solid state except 2 valves in

Tx — 25W — fitted with chan. 1, 4, 40 & 50, \$75. VK2AVQ, QTHR. Ph. (02) 88 2359. 1 kVA Powamac, 3 hp B & S. \$160, VK3VK, OTHR. Ph. AH (054) 23 7213.

Swan 400, excellent condition, external power su ply, spare set tubes, microphone, manual, \$325 ONO, Noel Hill VKINH, 50 Hicks St., Red Hill, Canberra. Ph. (062) 95 0992 pm only: (062) 41 1000 bus.

Hallicrafters SR150 Transceiver, 80-10m, works well all bands, new PA tubes, complete with hor PSU, \$300 OND, VK3ZU, OTHR, Ph. AH (03) 560 5136.

FTDX 400 SSB Transceiver, 80-10m, in excellent working condition and appearance. Complete with SP400 matching speaker unit, handbook and spare valves, \$400. VK5GV, QTHR. Ph. (08) 262 5152. Hallicrafters HT32A, xtal filter Tx, 80-10m, 100W PEP, SSB, CW, AM, very good condition, with manual, \$165, Hallicrafters \$X101A Rx, 80-10m, 30.5 MHz, converter channel, SSB, AM, CW, variable selectivity, very good condition, with manual, \$200. Both units and "Slidup" auto trans., \$360 ONO, VK3HZ, QTHR. Ph. (03) 56 5088.

Advance type D1D VHF sig. gen., 10-300 MHz fund sine, SQ, CW, calib., xtal, VM accurate calib. dial and atten. cables and term. Weight 38 lbs., mint cond., \$260. VK2ZRD, CTHR, but post code 2082.

Yaesu FT200 and FP200 PSU. Offers wanted for these and sundry components. All must be sold on behalf of the estate of the late R. N. Buzacott VK3AUB. VK3VF, QTHR. Ph. (03) 723 3554.

12V to 240V 50 Hz .5A Converter, 125 VA regulated and protected. Fully solid state DC Electr Model 100. Can be slaved to other units, \$60. VKSTT 3 Ilford Street, Vale Park. Ph. (08) 262 5313, ext. 2387, bus. hours. Fibreglass Guy Line, 5000 lbs tensile, 60 cents per etre, also 7/18 galv. strand, two tons. VK4WR, 6 Olive Court, Nambour, 4560. FTS01, just 8 weeks old, complete with matching power supply, digital readout, etc. immac. con-

must sell, \$500 ONO. M. Hardy, VK2AAM, New-castle, Ph. 20321 bus. hours. 40 ft Oregon Mast, 4 x 4 at base, tapers towards top. Any offers, VK2DT, 2 Patya Close, Epping, 2121. Ph. (02) 868 1131 - delivery can be arranged

Collins R391/URR Receiver, .5-32 MHz in 32 bands. See AR articles, \$400. Hewlett Packard 524B freq. meter, 0-100 MHz, 8 digit readout, \$120, good cond. with manuals. J. G. MacIver, VK4JE, QTHR. Ph. inication Rx type R5223, covers 1.5 MHz to

30.5 MHz in 29 switched bands. BFO noise limiter, inbuilt PSU for 230/110 or 24V DC, inbuilt speaker, with all leads, headphones and complete so manual, tested overall on all ranges 2 uV for 10 dB S/N. Unit is similar to the 51J series of receivers, \$200. C. Cook VK3ZBD/T. Ph. (03) 89 2117 (AH). TCA1676 Hi-Band TXCR, unconverted, \$25 ONO. Power Transformer, 500V CT to 3000V CT at 100-500 mA, cheap. Large numbers Rx and Tx tubes, cheap. Parts and CROs for SSTV, all types of meters. W. H. Ross VK3UT, QTHR. (055) 69 5220. Barlow-Wadley XCR30, Rx 500 kHz - 30 MHz, \$200.

Yacsu Musen FV101, VFO, \$90. Swan 140 Trans-ceiver, converted to 80-40-20 TOPAZ 12V supply, HB AC supply, hell whips, etc., \$200. VK3PZ, QTHR. Ph. (03) 288 1047. Collins 30L-1 Linear Amplifier, in Immaculate con-dition, with manual, \$400. Ian McCosker VK4PF, P.O. Box 274, Surfers Paradise, Qld. 4217. Ph. (075)

SELL Handbook for CE type SC6B single channel VHF R/T equipment, \$10.00 plus postage. WANTED Handbook of service instructions for sweep generator AN/TRMS and manual for Micovac VIVM type CT54, VK4ZTJ, Ph. (072) 88 6343.

SR550 Hamband Rx, \$70.00, R. Davies, Box 909. Orange, 2800. Ph. (053) 6082 bus. hours. or (063) Multi-7 two metre transceiver, complete in original

carton, fitted with Repeater channels 1, 2, 3 & 4, Contra Repeater channels 1, 2, 3 & 4, plus simplex channels 37, 40, 43, 50 and 51. Exchange for FT75 outfit. Cash adjustment. VK4UX, QTHR.

Heathkit Oscilloscope Model 0-12-U, response to resultant oscilloscope model 0-12-U, response to 65 MHz. New BWD CR tube and Mu-Metal shield filted, good order, price \$90 ONO. Heath-Kit Electronic Switch to suit above, response to 100 MHz, good order, price \$30 ONO. Ric Hill VK3RC, QTHR. Mia Mia Road, Broadford. Ph. Broadford 359 (STD 057842211 to exchange)

Silent Kevs

It is with deep regret that we record the passing of-

R. N. BUZACOTT VKSAHR

New UR67 Coax Cable, 50 yard roll, \$25, plus freight. Max VK4DA, QTHR. Ph. (074) 63 3524. QSTs, professionally bound, light blue with gold lettering in sets of six, Jan-June 1968 to Jan-June 1975, i.e. 15 in all. Roth Jones, 1 Albert Rd., Melbourne, 3004.

WANTED

May 75 Issue of RSGB Radio Communication. My copy lost in mail, Write Ron VK3CN, 26 Radovick Korumburra, 3950. FTV-850 or similar 6 metre transverter. VK4VK, 6 Tosti St., Sorrento, 4217. Ph. (075) 38 4164. Antique Amateur Radio Gear, pre-1935, prefer in restorable condition, your price paid. VK3OM, QTHR.

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single gang 350 pF, willing pay any reasonab prices. VK3LJ, QTHR. Help - poor student trying to get on 160m. Needs or OY3/125 Sam VK2BVS VK2BGV QTHR. Ph. (02) 407 1068.

Mast, tilt-over and/or crank-up. Also rotator and 20 metre beam or tri-bander. Mal Sinclair VK2BMS, QTHR. Ph. (02) 407 0261 bus. hours or (02) 95 2352 20, 40 and 80 metre coils for AR7 Communications

Receiver, push-in type coils, approx. 11 inches long, 2 inches wide. Write to P.O. Box 85, Umina Beach

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SWAN URGENT NOTICE

Would the Holders of the following Swan Amateur Radio Equipment or any persons knowing of such Equipment please contact the advertiser at their earliest convenience. This Notice is in the best interest of all persons concerned.

SWAN MODEL 700CX-SS16 SPECIAL FILTER

SERIAL NUMBER 19199

SWAN MODEL 700CX STANDARD FILTER

SERIAL NUMBER 16171 SERIAL NUMBER 19779

SWAN MODEL MB80A MOBILE

SERIAL NUMBER 16788

SWAN POWER SUPPLIES MODEL 230XC

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A.H. 522-7272

VHF Mobile/Base Station FT-221 2 Meter Transceiver





SOLID STATE ULTIMATE 2 METRE TRANSCEIVER WITH VERSATILE SSB/FM/CW/AM OPERATION

Here is a compact, versalls transceiver designed for the active 2 metre enthusiast. The FT-221 features all mode operation — SSMFMM (WMA — with repeater offset capability. Advanced phase lock loop circuitry offset sustrapssed stability and clean spurious free signals. Modular, computer type construction offers reliability and ease of service. Pre-set pass band tuning provides the optimum selectivity and performance needed on lodary's active 2 metre band, John the fun on FM, DX, or OSCAR, with the FT-221 transceiver, hother winner from the world's leader in amateur communications equipment.

FFATURES

- Complete 144-148 MHz coverage in 8 band segments Dual rate, concentric VFO dial drive with better than 1 kHz
- Built-in AC & DC power supplies
- SSB/CW/FM/AM operation Selectable ±600 kHz repeater offset

- Built-in VOX and break-in CW
- External tone input connector Built-in 100 kHz calibrator.

TECHNICAL DATA

GENERAL Frequency Range: 144.00 to 148.00 MHz in eight 500 kHz segments.

Mode: SSB (selectable USB or LSB), AM, FM or ow. Frequency Stability: Within 100 Hz during any 30 minute period after warm-up. Not more than 20 Hz with 10% line voltage variation.

Calibration Accuracy: 1 kHz maximum after 100 WHY calibration.

acklash: Not more than 50 Hz. mtenna Impedance: 50 ohm unbalanced nominal. ower Requirement: 100/110/117/200/220/234V AC, 0/60 Hz, 100 VA maximum or 13.5V DC, 3A 50/60 Hz. transmit maximum (11.5-16.5V DC).

Size: 200(W) x 125(H) x 295(D) mm Weight: 8.5 kg (Shipping weight: 13 kg). RECEIVER

Sensitivity: 0.5 uV for 10 dB Noise plus Signal to Noise Ratio on SSB/CW. 1.0 uV for 10 dB Noise plus Signal to Noise Ratio with 400 Hz 30% modulation on AM. 0.75 uV for 20 dB quieting on

Selectivity: 2.4 kHz nominal bandwidth at 6 dB down, 4.1 kHz at 60 dB down on SSB/CW/AM. ±6 kHz nominal bandwidth at 6 dB down, ±12 kHz at 60 dB down on FM. Harmonic & Spurious Response: Image Ratio better than 60 dB

Built-in effective noise blanker Three way metering: S meter, power output, and FM

discriminator 11 crystal channels per band segment = Total 88 channel

SSB output 12 watts PEP

FM/CW output 14 watts AM output 2.5 watts # Built-in speaker

Audio Output: 2 Watts to Internal or externa-speaker at 4 ohm Impedance. Squeich Threshold: Loss than 0.3 uV. I.F. Frequencies: SSB/AM/CW 10.7 MHz, FM 10.7 MHz and 455 kHz.

TRANSMITTER

Spurious Radiation: -60 dB. Frequency Response: Balanced SSB 300 to 2700 Hz :+3 dB. Low power AM better than 60%. Variable reactance FM +7.5 kHz maximum. Carrier Suppression: -50 dB. Sideband Suppression: -50 dB.

90 DAY WARRANTY

All prices include S.T. Freight & ins. extra. Prices and specifications subject to change. Spare parts availability. Full service facilities with after-sales service only from the authorised YAESU AUSTRALIAN AGENT:-



ELECTRONIC 60 Shannon St., Box Hill North. SERVICES OLD. MITCHELL RADIO CO., 59 Albion Road, Albion, 4010 N.S.W. STEPHEN KUHL, P.O. Box 56, Mascot, 2020

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